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STATE DOCUMENTS

BIENNIAL REPORT

OF THE

Inspector of Coal Mines

OF THE

STATE OF MONTANA

FOR THE YEARS 1909-10

Joseph B. McDermott, Inspector

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JANUARY 1, 1911

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INDEPENDENT PUBLISHING COMPANY, HELENA, MONTANA.
ALLIED PRINTING TRADES UNION LABEL COUNCIL HELENA

OFFICE OF THE STATE COAL MINE INSPECTOR.

Helena, Montana, December 31, 1910.

Honorable Edwin L. Norris,
Governor of Montana,
Helena, Montana.

Sir:—

In accordance with the provisions of the Montana Statutes I herewith submit to you report of this Department covering the years or periods from Octobebr 31, 1908 to November 1st, 1910.

Respectfully submitted,
JOSEPH B. McDERMOTT,
State Coal Mine Inspector.

In submitting the report of this Department of the State Government we feel considerably elated over the increased production of coal, in our Montana mines, over any corresponding period of time in the history of coal mining in the state.

The Production for 1909 period and 1910 period, from Oct. 31, of 1908 to Oct. 31, 1910, was—5,511,925 tons of coal.

The greatest production reported previously was during our Fiscal Lears 1907 and 1908, when the production was reported at 4,008,911 tons an increase in production the two last years over the two preceding years of 1,503,014 tons or 37 per cent increase; the development and equipment in and around the coal properties have kept pace with increased production, but the accident list grows no less, tis true the figures will show that during 1907 and 1908 period, that each 160,356 tons of coal produced, cost one life; that each 38,547 tons of coal produced there was a serious accident, and in 1909 and 1910 period there was produced for each life lost, 190,066 tons of coal; for each serious accident, 48,341 tons, but the rate killed and injured, per thousand employed, is no less and in fact for fatal accidents, greater.

A serious disaster occured in one of our mines, November 20, 1908, in which Nine men lost their lives and several more had very narrow margin in getting to the surface with theirs; a wooden crib, put in for support of the roof at 3rd East entry by some means was set on fire, the slope was downcast for the air current and in a very short time the mine was filled with smoke and men warned to get out of the mine, nine were lost; several more overcome by the gases generated by the burning wood; this mine No. 2 of the N. W. I. Co., Red Lodge, Carbon County, was connected to No. 4 slope by rock tunnel, also with No. 1½ vein with an incline tunnel, the men rescued were brought out by one or the other openings.

The origin of the fire remains a mystery although evidence at the Coroner's Inquest, which lasted two days, was offered showing there were seven persons at or near the crib that was the cause of the disaster, within one half hour of the time that the alarm was given to get out of the mine.

Herbert Sands being asked at the inquest: "How long it had been since he left the crib until he got back there and found the crib on fire?", answered "I should judge, between 6 or 7 minutes just long enough to go up to the top and bring an empty trip back."

That the mine at the time was not satisfactory to the inspector—ventilation of No. 2—nor to the General Superintendent C. C. Andersen who was making efforts to re-arrange the ventilation of that mine and in 2 or 3 days more would have moved No. 2 fan to the top of the inclined tunnel on No. 1½ vein and then the results of a fire in that mine would be a different story.

The Inspector is of the opinion that some one carelessly changing a cotton or something of that kind unconsciously set fire to the crib that caused so much havoc and nothing good would come of acknowledging it at this time.

The sensational story of the fire sent broadcast at the time of a fire that had been walled up in that mine for several years, was to say the least ill-advised—the fire walled up is in No. 4 vein, is under control as well as it is possible to have such things and there is some 200 feet of Rock between the veins and the fire is the lower strata of the two.

Without attempting to flatter we say that under the present management things look different around the property of the N. W. I. Co., since the management changed hands. Read the story of improvements under the head of improvements in and around mines.

This disaster added 21 to our accident list.

I have gone over the accidents since we have any record of same and have, the best we could with information at hand, classified them, arranged them for thought and study and hope that from a study of them some good legislation will be derived.

The past two years were fairly free from labor troubles and disputes though there were some local differences in Lewistown, Roundup, and in some of the mines in Bear Creek, but no general strike or suspension, during this time, of all the mines, but the Switchmen's strike the latter part of 1909 and beginning of 1910 year curtailed the output from our coal mines, on account of R. R. service.

The Coal Operators Association and United Mine Workers of America met in Billings, in September of this year and a working agreement was agreed upon for the ensuing two years; substantial advances were granted to the mine workers and a semi-monthly pay day for the workmen; on the whole the relations are amicable between the organizations.

In anticipation of a suspension, there was considerable coal stored before the expiration of old agreement and adoption of new one, and as a consequence work has not been so brisk since in some of the mines, but business on the whole is fairly good.

The future looks more promising for the coal mines in Montana the building of two new Trunk Lines of Railway through the state—the C. M. & P. S. R. R. and B. & N. R. R., the increase of population, due to emigration of people from the Eastern states to Montana in search of homes, all of which calls for an increased supply of coal, and with increased facilities for moving coal new territory will undoubtedly be invaded.

Another line of railway is building through from Wyoming, the grade of which is practically completed at the present time, will give easy access to our coals of markets which we have been unable to enter heretofore.

With other through lines and cut off lines in contemplation, business prospects look very bright indeed for the coal producer, and in anticipation of this increased business, new mines are being opened, older ones remodeled and installation of machinery for the production of coal and the better preparation of the same for markets is and has been more active the past two years than any like period in our history.

In 1890, the production of coal, in Montana, reached according to the U. S. G. S., for the first time the Half Milion Mark. The following are the figures for 11 years gathered by them.

Year	Number of men employed	Tonnage (short tons)
1890	1,251 men	517.477 tons
1891	1,119 men	541,861 tons
1892	1,158 men	564,648 tons
1893	1,401 men	892,309 tons
1894	1,782 men	927,395 tons
1895	2,184 men	1,504,108 tons
1896	2,335 men	1,543.445 tons
1897	2,337 men	1,647,882 tons
1898	2,359 men	1,479,803 tons
1899	2,378 men	1,496,451 tons
1900	2,376 men	1,661,775 tons

Figures Gathered by Howard F. Welsh.

1901	2,158 men	1,442,569 tons
1902	1,938 men	1,502,115 tons
1903	2,418 men	1,514,538 tons
1904	1,813 men	1,471,504 tons
1905	2,289 men	1,743,771 tons

Figures Gathered by McDermott.

1906 (10 months)	2,309 men	1,502,200 tons
1907 period	3,229 men	2,030,564 tons
1908 period	3,642 men	2,030,564 tons
1909 period	3,862 men	2,541,679 tons
1910 period	4,117 men	2,970,246 tons

The figures gathered by McDermott, were: 10 months of 1906.

The periods are from October 31, of one year to November 1, of the next.

There were 58 properties reported production of coal to this department for our Fiscal year—from Oct. 31, 1908 to Oct. 31, 1909. The total tonnage reported was 2,541,679 tons this was the largest production for a like period up to that time in the history of Montana coal mines; in producing this amount of coal there were employed:

Machine Operators	182
Loaders	358
Miners	1,779
Inside daymen	840
Outside daymen	704
Total men employed	3,862
Average tonnage, per day, per man	3.4 tons

From Oct. 31, 1909 to Oct. 31 1910 the production was 2,970,246 tons:

Employing Machine Operators	212
Employing Loaders	447
Employing Miners	1,947
Inside daymen	755
Outside daymen	756
Total men employed	4,117
Average production, per man, per day	3.3

Production by Counties in 1909:

Rosebud County	551 tons
Valley County	1,743 tons
Custer County	7,355 tons
Gallatin County	7,441 tons

Chouteau County	22,816 tons
Yellowstone County	43,994 tons
Park County	117,483 tons
Fergus County	245,229 tons
Cascade County	996,571 tons
Carbon County	1,098,496 tons

Production by Counties in 1910:

Custer County	3,350 tons
Valley County	4,018 tons
Chouteau County	22,986 tons
Gallatin County	29,862 tons
Park County	101,269 tons
Fergus County	303,649 tons
Yellowstone County	378,087 tons
Cascade County	929,595 tons
Carbon County	1,197,430 tons

Total tonnage for 1910 period of 2,970,246 and represents an increase over 1909 period of 17%. There were 52 properties reported production this year.

Of the larger mines which reported production to this department for the years 1907 and 1908:

Trail Creek Coal & Land Co., mine has been abandoned; Washoe Copper Co., (coal Dept.) Storrs mine abandoned; Washoe Copper Co., (coal Dept.) Washoe, No. 1 mine abandoned; Northwestern Improvement Co., Mt. Side mine, Chestnut, output curtailed; Republic Coal Co., No. 1 mine, Roundup, abandoned; Smokeless & Sootless Coal Co., No. 2 mine abandoned; Montana Coal & Coke Co., mines at Aldridge & Electrc, suspended.

New Mines Opened Up.

Cottonwood Coal Co., Stockett, Cascade County, No. 6 mine; Republic Coal Co., Klein, Yellowstone Co., No. 2 mine; Roundup Coal Mining Co., mine A. Roundup, Fergus County; Keene Coal Co., Roundup, Fergus County, No. 1 mine; Davis Coal Co., 4 miles east Roundup, Mine No. 1; International Coal Co., Bear Creek, Carbon Co., No. 3 mine and slope; N. W. I. Co., Red Lodge, Carbon County, No.'s 1½ and 5 and 6 slopes; Washoe Copper Co., (coal Dept.) Washoe, Carbon County, No. 2 slope; Smokeless and Sootless Coal Co., Bear Creek, Carbon County, No. 3 slope; Bear Creek Coal Co., Bear Creek, Carbon County, No. 4 mine; Bridger Coal and Improvement Co., Bridger, Carbon County, No. 2 slope.

Greater Tonnage.

Greater Tonnage, is the slogan, and perhaps the reason for less precautions for safety, and healthfullness. This is the case not only with the Operator, but with the Miner.

The old method of mining to help the shot and lessen the amount of powder necessary to break it down, is fast becoming a thing of the past.

The indiscriminate use of powder being responsible for many of our accidents, displacing timbers that have been set up, and allowing subsidence of the roof before being replaced and often before the first setting.

In the mad rush to produce tonnage coal is gotten down almost any old way; places that are supposed to be cut before shooting—in the entries especially—holes are drilled from 1 to 3 feet on the solid with no other purpose than to make a powder crack, so that it will cut easier.

It is not the foreigner alone, that charges the holes with powder with utter disregard for the safety of themselves and their co-workers, but our English speaking people as well and when taken to task of the probable danger of such a course, will attempt to justify themselves by "a man can't make a living in this mine with present prices, without doing so," and in the same breath will say "yes I know it is unsafe, or I think it is."

Those practices the operators are fully cognizant of, or could with a reasonable effort, find out, but it is—get out the coal.

It is indeed surprising to what lengths this recklessness leads, when coal properties are blown up and becomes a total wreck or practically so, from some just such practices, aside from the loss of life and maiming of the workers who may happen to get out alive, it must be an expensive proposition, even though it is practiced for cheaper production.

As yet, in our Montana Coal mines, there has been no serious disturbance from powder, gas, or dust explosions; this too was the history of several other coal producing states up to a certain period of their history.

Utah, passed through just such experiences. I recall reading a very interesting account, in one of our mining journels, of the installation and equipment for sprinkling roadways and working places; shot firing apparatus; firing by battery, when all the men were out of the mine, not even the shot firer in the mine; and the writer of that Article said: "They had waded around in dust, ankle deep, kegs of powder had been known to explode in the mine, and nothing serious happened; yet the time came and the circumstances warranted the installation of the most complete system of sprinkling and shot firing in the World.

We, at the Mine Inspectors' Institute, held in Chicago, Ill., June of this year, listened to an interesting description of firing by battery in some of the mines in Alabama, by Mr. Flynn, ex chief mine inspector of Alabama, now in the employ of some of the larger operating companies, as mine inspector, he described the method used of wiring and said that the man who went in to connect up the wires was obliged to come out and get from the engineer the key to connect the circuit, thus assuring that every one was out of the mine, and he pronounced it a success, and said that his company was satisfied with it, and said that even if the mines were blown up when shooting, there would be no sacrifice of lives.

There are reasons, why the shooting should be done by others than the miner, that should appeal to the Operator, even if he were indifferent regarding the safety of his workmen, with the scale of wages based on "mine run" it makes no difference to the miner the condition of the coal broken down; it does to the Operator. The argument that the miner pays for the powder and he will not waste it, is not bourne out by the size of slack piles hauled out and paid for; it costs just the same as lump coal; costs just as much, or more to haul it out; costs more to put it in the waste pile than it would to dump the same amount in the car; haul it out they must for it does less damage burning outside that it would in the mine.

Propose a Bill in the Legislature to compel all coal to be undercut before being shot down, that no powder charged hole to be fired that was nearer than 6 inches to the back of the mining, and the chances are that there would be 2 lobbyists busy.

What would be the result of such legislation?

It would not require as many holes to break down the coal; it would require less powder; the coal broken down would have considerably less slack in it; bone and dirt could be more easily separated from the coal, by hand; less displacement of timber when shooting; less damage to the roof; easier and quicker loaded; better price for the coal than bull-dozed coal; would stand the weather and shipment better; and the best reason of all is there would be less accidents.

What would be the objection to this system?

From the miner, more pay for the work; it would work a good deal like an educational test in some states, it would disfranchise a good many, so called miners; it would impose new conditions and that would interfere with present "wage scale."

What would be the objection of the operator to this system?

Higher prices for mining coal; for a time at least, it would put a premium on pick-miners; installation of machinery to mine the coal. Suppose we in our present period of immunity, from any of those night mares or illusions we have concerning the possible dangers; those, that have come about in other mining states, where practically the same conditions exist, and having coals of about the same chemical composition. Suppose, we do like the miners and operators did with regard to the Insurance Law, for Permanent Disability and Death Fund, petition the Legislature to pass a law, forbidding the shooting of coal off the solid. Safe guard this. Let there be no "Jokers" in it; have this particular law go in effect, November 1st, 1912.

This would give the miner, and operator and others a breathing spell, time to adjust themselves for better conditions; those following mining for a livelihood, would have a chance to brush up.

The operator would have time to arrange his affairs to meet the new conditions. This would not interfere with present arrangements, we might in the meantime, just to show our good faith, mutually agree upon a just and equitable, shot firer's law; agreeing upon how to select, by whom paid, define the responsibilities, duties and powers and privileges of the shot firer.

While some of the coal mines in Montana, give off CH_4, and there have been 22 men reported to this department, seriously injured in small explosions of this gas, yet there has been but one death, that was attributed to this gas, and that was in Aldridge in 1895.

But, our mines are reaching greater depth, more gas being encountered, and with the quantities of powder used, coal pulverized with the indiscriminate use of the same, the accumulations of small pockets of gas, and the ignition of same in the presence of dust laden atmosphere, and even mines where no fire damp has been detected, make it worth while considering and watching.

Knowing the prejudice that exists in the minds of a great many men engaged in the mining business, having talked with several of them, who are serving in different capacities in and around the mines, concerning the possibility and probability of an explosion of dust in the coal mines—in the presence of small bodies of fire damp, and in the entire absence of —I feel that it would not be amiss to state briefly the experiments conducted at the Experimental Station at Pittsburg, Pa., June 13, 1909, on the occasion of a visit to the station of the Mine Inspector*s Institute of the United States of America.

At the Experimental Station at Pittsburg.

A large cylinder of boiler iron, called gallery No. 1, 100 feet long, a little over 6 feet in diameter; one end closed with concrete block, in which is placed a cannon from which charges of powder were fired in the presence of coal dust; the gallery has 15 sections, each 6 feet 8 inches long; with a window on the side in the middle of each section, and a relief door, hinged to the top of each section—they reminded me of the coal holes in sidewalks for putting coal in basements of buildings—in the first 3 sections horses were arranged to place coal dust upon a little below the line of bore hole in cannon, about 20 lbs. of coal dust, ground to 100 mesh fine, and along on either side of the cylinder or gallery was placed 50 lbs. coal dust on shelves making about 120 lbs. of coal dust, and a charge of black blasting powder, tamped with clay, this charge was fired in the presence of this dust, without any gas present, ignited and caused the flaps or doors spoken of to open violently and slam back shut again, in some cases, flame was visible in windows from 1 to 15; also in doors from 1 to 15; great volumes of smoke which seemed to swell as it escaped from the cylinder through the doors that staid open.

In this same gallery tests were made with different kinds of powder fired in the presence of an explosive mixture of gas and air at its most explosive point.

Powders that can be fired in the presence of such mixtures of explosive gas, or dust, and in 10 consecutive trials do not ignite the mixture are placed by our Government on what is termed "Permissable List" I would mention here that some explosions have occurred in our mines in America with "Permissable Powders" since those tests have begun at Pittsburg, but in our opinion, this is no argument against their use, the probability of explosions would be still greater if black blasting powder had been used in those mines.

Tests were made with different types of safety lamps, in varying velocities, also parties sent in to galleries filled with gas to determine the sensitiveness of the different lamps; gallery No. 2 was filled with an explosive mixture of gas and air and electric current applied, 250 volts used and flash from knife switch exploded the mixture; those who desired were permitted to don the various head protectors or helmets used for rescue work and entered a room filled with Sulphur fumes, the room was built and equipped to resemble a miniature mine.

The following is the record of a test made of Bear Creek No. 3 seam, samples of which were taken by Mr. Groves of the U. S. G. S. and were taken from fine coal bin on the surface, from machine cuttings that were being thrown back in the gob in the mine, and a cross section of the coal seam.

On page 48, Bulletin 425, Department of the Interior, U.S. G. S. Title—The "Explosibility of Coal Dust," by Geo. S. Rice and others. In a table, headed Special Explosion—gallery tests with bone dust road dust, and mixtures, you will find Test No. G-693. Test No G.-693, date, Jan. 29, 1909, black powder used, Single F. weight of charge, 500 grams, (About 16.1 oz.) dust on horse and shelves in sections numbered O—flame showed in doors from 1 to 6; in windows from 1 to 11—length of flame 54 feet; ignition, yes; propogation, yes.

Test No. G-693—from Bear Creek No. 3 mine, Bear Creek, character and source of coal sample—sub-bituminous coal and bone cuttings. Analyses: Moisture 8.94 per cent, volatile Combustible 30.57 per cent, Fixed Carbon 43.49 per cent, Ash 17 per cent, Sulphur 1.78 per cent.

The charge of single F, black powder was the powder used in the mine at this time the sample was taken, sample keg having been taken with the samples of coal, the charge used in the test would be about 9 inches on a 2 inch cartridge stick.

While there are many reliable authors having works published concerning dust and gas explosions, I want to quote from the above described, excerpts of the U. S. G. S. of our own country and their deductions from experiments made along the same lines in other countries.

EXCERPTS FROM GOVERNMENTAL INVESTIGATORS ON EXPLOSIBILITY OF COAL DUST.

In his introductory, among other things, Mr. Rice, says: "Fire Damp carries its own flag of warning—the "cap in the safety lamp"—but coal dust, though visable, does not attract attention until present in large quantities. "Firedamp is of local occurence, and except in notable and very exceptional cases is controllable by careful manipulation of the ventilating currents.

If by mischance a body of fire damp is ignited in a mine, the force of the explosion is terrific, but the effect is localized unless dry coal dust is present, or unless (as it very rarely happens) an explosible mixture of methane gas and air extends through large areas of the mine. In a dry mine dust accumulates everywhere, and the blast from the ignition and combustion of bituminous dust may traverse miles of roms and entries and wreck structures at the entrance to the mine.

Agencies That Distribute Coal Dust.—Same Author.

While coal dust mainly comes from breaking down coal at the face of the mine, it is distributed through the mine in several ways:

1. By the force of the explosive used.
2. By shoveling of coal along the face and into pit cars.
3. By the fine coal running through cracks and holes in pit cars, and particularly under the car door, which usually fits more or less loosely, and thus being distributed along the haulage ways.
4. By lumps of coal jolting off the top of pit cars and then being ground up by the traffic of men and mules or horses. This condition is found particularly at sidings and at "main bottom" owing to abrupt stops while the cars are moved and switched.
5. By ventilating currents, which pick up the "float dust" at the face, and more particularly from the tops of cars.

The passing of trips of cars, partly blocking the air way, causes a very high velocity past the cars especially when they go through a single ventilation door. If the hoisting shaft is dry and is a downcast, and the surface screens are near the top of the shaft, the ventilating currents may draw considerable quantities of dust from the screens.

Dry coal dust along the passage ways or entries of a mine is a great menace. While in this country the great majority of dust explosions have originated at the face from blown-out shots or overcharged shots, the propogation has been through dusty entries.

If the entries were free from dry coal dust the explosion would be local. Again, some explosions have originated on the entries from igniting pockets of gas in poorly ventilated entries; or in shooting down the roof for overcasts, or in brushing or grading.

The problem is not alone to treat the dust lying on the floor, but the fine "float dust" that lodges on walls, roof, and timbers.

Every lodge and projection has a coating of more or less thickness of the purest coal dust.

In the opinion of many writers, what Mr. W. N. Atkinson terms "upper" dust is more dangerous than "lower' dust, because it is more finely divided. This will evidently depend upon the characteristics of the dust—whether it is coal dust or rock dust and whether the former retains its strength. The ventilating currents have a sorting action, dropping the coarser particles to the floor and lodging the finer higher up.

After giving results of tests with different dusts, and results of investigations made in the mines in America after explosions in which dust was supposed to play a very important part, the writer, Mr. Geo. S. Rice gives, Tentative Conclusions on the Dust Problem: Factors Affecting Explosibility. Volatile Combustible Matter.

"That coal dust will explode under some circumstances, both in the presence of fire damp and without it, is now generally accepted by mining men. The writer fully agrees with this and takes the following views of the explosibility of dust and the conditions necessary for explosion.

Experiments at Pittsburg indicate that under ordinary conditions the dust must be from coal having at least 10 per cent of volatile combustible matter, though in certain foreign experiments it is claimed that explosions were obtained with charcoal dust.

Dusts with higher percentages of volatile matter are more sensitive, ash, moisture contents, and size being constant.

This view is based partly on the preliminary experiments at Pittsburg and on the results of experiments of M. Taffanel and other foreign investigators.

Structure and Size.

Physical structures and size of the dust particles are factors in the relative sensitiveness. In coals approaching the border line of non-explosibility, structure and particularly size are the more important, and affect ignition. That is, the less readily the dust gives up its gases the larger and more intense must be the igniting flame.

Whether or not concussion or compression of the air at the moment of attack by the flame is required for the ignition of the less sensitive dusts and the propogation of the flame is a question yet to be answered, but it is self-evident that the larger and heavier the particles are the more difficult it is for the air waves in advance of an explosion to bring them into suspension where the flame can strike them.

Density.

For continued propogation of flame the dust particles must be so close together that the burning gas enveloping one dust particle will cause distillation of the volatile matter of the next particle and ignite it. In other words, at each successive moment of inflammation there must be a certain density of dust for each character and size of dust.

It appears to the writer that the combustion of the fixed carbon of an average-size particle of coaldust will not take place until the volatile matter of the particle has been volatilized and burned in the surrounding air. If this is true, the oxidation of the fixed carbon probably does not, except in dust particles of minutest size and greatest purity, take place in time to assist in the first extension of the flame, although it is undoubtedly an important factor in the succeeding moment, intensifying the flame, and hence increasing the violence and pressure of the explosive wave.

The analyses of burned dust from explosions, both in mines and in Pittsburg gallery, show an increase in percentage of ash over the ash content of the original coal often considerably greater than the increase due to expelling the volatile matter. Such an increase shows that there has been combustion of the fixed carbon. The increase in ash has been especially marked in the 200-mesh dust used in the Pittsburg density tests.

M. Taffanel's experiments with anthracite and those at the Pittsburg station indicate that under the conditions in the galleries used anthracite dust will not propogate an explosion. This supports the view expressed above that it is the burning volatile combustible gases that carry forward the igniting flame and that the combustion of the fixed carbon is secondary.

Moisture.

Moisture contained or carried in coal dust is probably converted to steam before gas is evolved from the dust particles, and if enough moisture is present the absorption of heat in this way may prevent sufficient heat from being imparted to adjacent dust particles to evolve and raise their volatile gases to the ignition point. Furthermore, if the moisture in or surrounding each particle of dust is sufficient in quantity, the vapor therefrom will dilute the evolving gases or else tend to surround them with an outer incombustible envelope and so prevent the immediate ignition of the combustible matter necessary for propogation.

Ash Content.

The ash content of the coal, within ordinarv limits, does not appear to affect the explosibility of the coal dust; but if an inert dust, such as stone dust, is raised into the atmosphere with the coal dust by the advance air wave, it will affect results in two ways—by separating the coaldust particles with a barrier and by absorbing some of the heat of the impinging flame, and thus lowering the temperature below that necessary for the ignition of the gas distilled from the adjacent coaldust particles.

Outward Conditions.

The writer concludes that the outward circumstances under which coal dust will explode may be summed up as follows: Sufficient dust must be brought into suspension by a preliminary shock or concussion producing a violent air wave; or else the dust must be so minute that it is already suspended in a dense enough cloud at the moment when the flame impinges. The latter effect is produced only under some peculiar circumstances by which a large amount of fine coaldust is thrown into a strong air current and carried to the igniting flame. The former effect may be produced by a heavy shock like that of a falling body, but it is more likely to result from a preliminary explosion of fire damp or, more commonly, of an explosive.

Some Hints That Montana Coal Mining Men Might Heed.

The general consensus of opinions are that tamping powder charged holes with fine coal or dust is dangerous, and would elongate the flame of a blown-out shot.

Another deduction is that, explosives the least flameless, the better to use in places where small quantities of gas are present or likely to be present, and in dry and dusty mines, permissible powders should be used in preference to black gunpowder.

Care should be exercised in placing shots, holes properly tamped, with clay preferably—to prevent if possible blown-out shots.

Care and caution and judgment in not overcharging holes with powder, as evidence is given of explosions from over-charged holes.

The thorough cleaning up of roadways and wetting, sprinkling, and treating with Calcium Chloride is advocated.

The freshly mined coal (fine) is admittedly the most dangerous of fine coal dusts, and places should be thoroughly cleaned of same, before firing off shots—(not gobbing but hauling it out of the mine.)

There should always be intermission between shifts, going on and off, to allow the air currents to clear the mine of smoke, also for the settling of dust, as from the agitation from shoveling of coal, running of cars, etc.

It seems to be the opinion of some experts that have conducted experiments with coal dust, that, the increasing order of inflammability is the same as the increasing percentage of volatile matter.

We are cautioned that although very fine coal dust may be mixed with fine rock dust, that with a concussion the very fine coal dust may become suspended in the air, without raising the coarser and heavier particles of rock dust, this looks reasonable.

From the experiments made by the U. S. G. S. at the Experimental Station at Pittsburg, it shows that slight dampness is not sufficient to prevent flame propogation by an explosion; that with a high volatile and pure coal it is necessary to have a total moisture of 30 per cent to insure against propogation.

This amount of moisture does not make 100-mesh dust seem excessively wet. It can be balled up in the hand. Forty per cent of water the 100-mesh dust and water mixture becomes a coal mud.

The exhaust steam of pumps and fans and in some cases, live steam, is turned in the intake airway, generally practiced on night shift, the effect is to raise the temperature of the ingoing air and saturating the aircurrent, also sprays used in connection further on the air current.

As so much has been said of the extraction from the mine, of moisture, by the ventilating fans, the following tables by the U. S. G. S. is here reproduced:

Average of Humitity Observations During March and April, 1909, in Dry and More or Less Dusty Coal Mines.

STATE.	Number of Mines.	Series of Observations.	Temperature.		Relative Humidity.		Water extracted from dust and walls per 100,000 cu. ft. of air gallons.	Water extracted from dust and walls in 24 hours—gallons.
			Intake, Degrees F.	Return, Degrees F.	Intake, per cent.	Return, per cent.		
Alabama	5	5	71	69	72.5	92.5	2.27	3,269
Iowa	3	3	46.5	56.5	61.5	93	4.70	6,768
Illinois	8	11	45.5	58.0	60.5	91	4.44	6,394
New Mexico	9	14	36	53	57	82	4.57	6,432
Colorado	1	1	72	70	18	85	9.02	12,991
West Virginia	9	9	58.5	56	63	94	2.32	3,341
Virginia	1	1	49	57	84	95.5	3.04	4,378
Pennsylvania	1	4	48	49	87	91	1.17	1,685
Total	37	48						
Average			53	58.5	63	90.5	3.94	5,657

The last column is based on the assumption that the average volume of the ventilating currents of the mines was 100,000 cubic feet per minute.

MEETINGS OF THE MINE INSPECTORS INSTITUTE OF U. S. OF A.

June 1909, there was a very interesting and instructive meeting held in Scranton, Pa., at which there was representatives from Ohio, W. Va., Illinois, Indiana, Oklahoma, Alabama, Iowa, Montana, besides the inspectors from Anthracite and Bituminous coal fields of Pennsylvania and the representatives of the U. S. G. S. Experimental Station at Pittsburg, Pa. It goes without saying that there was entertainment galore.

banquets, excursions, visiting surface workings of different collieries, breakers, and a visit to theTruesdale Colliery, speeches, papers and discussions on mining took place, also a visit to the experimental station at Pittsburg, in a body, where a program of tests were made with different powders in the prescence of gas and dust and dust alone. Safety lamps were subjected to different tests, different types of them, helmets donned and worn in smoke filled rooms, tests made with electric current in the presence of an explosive mixture of gas and air, etc., it was an interesting, impressive and a very instructive windup to the meeting indeed.

June 1910, the institute met in Chicago, Ill., where we had an interesting session, and the Illinois boys don't take a back seat when it comes to entertaining, the Institute got down to business in their meetings better at this session than in the two former ones; Charleston W. Va., is selected as the next place of meeting and the members are looking forward for an eventful session.

I am sorry we cannot invite the meeting to Montana, but the pace set is swift and inspectors are not as numerous in the west as in the east; Washington, Michigan and Wyoming was represented by delegates in person in Chicago, in addition to those attending the meeting in Scranton Pa.

For the good of the Institute and its members, the meetings of the Institute should be held where experiments were being conducted. The results of experiments might be discussed at the time so that if necessary for the enlightment of those present experiments could be repeated. They would form the basis for papers, that, after having received the indorsment of the Institute, would be published in the reports of the different inspectors, in this way more definite information will reach the workers and even those in charge of mines than almost any other way.

Pittsburg, Pa., is not centrally located for the coal fields but I presume it would accomodate a greater number of the membership of the mine inspectors' insittute than almost any other location until other stations were established and equipped as completely as it is, would be, if we are to make progress and get the benefit of research along scientific lines, the best place for the institute to meet in.

EXAMINATION OF SCALES.

Several complaints of the scales in different portions of the state, were made to this department, all of which were attended to and adjusted to the satisfaction of those concerned.

While on this subject, I think the department should be supplied with at least 2,000 more test weights—also some small weights—to avoid shipment as much as possible, besides it being expensive when weights have to be shipped from one part of the state to the other, considerable time is lost waiting for them.

WASH HOUSES.

This seems to be the cause of more complaints than anything else pertaining to the work of the Inspector, two cases have been started in the courts on account of complaints of the neglect of the companies complying with the law, while none of the companies have shown any disposition to contest the law; they have squirmed considerable in complying with it.

VISITS FOR STATE BOARD OF LAND COMMISSIONERS.

Visits and inspections of land supposed to contain coal have been made by the department and reports made thereon, copies of which have been filed in the Land Office.

EXAMINATION FOR CERTIFICATES OF COMPETENCY.

Since the passage and approval of the law requiring mine foremen, fire boss or mine examiner to appear before a Board of Examiners and demonstrate their fitness for their respective positions, two examinations have been held in Carbon County; two sessions in Cascade County; two sessions in Fergus County; two sessions in Park County; two sessions in Gallatin County; one session in Chouteau County; one session in Custer County and the following were granted certificates of competency in 1909:

For holding like certificates issued by competent authority in this and other states:

John C. Walker, Red Lodge, Carbon County; William Haggerty, Red Lodge, Carbon County; William R. Reese, Red Lodge, Carbon County; George Musgrove, Bear Creek, Carbon County; John Good, Washoe, Carbon County; Charles Sederholm, Washoe, Carbon County; John M. Kane, Bridger, Carbon County; William R. Freeman, Red Lodge, Carbon County;

James F. Brophy, Bear Creek, Carbon County; Hirst Beever, Chimney Rock, Park County; Charles Williams, Aldridge, Park County; Thomas J. Evans, Hoffman, Park County; Otto Anderson, Chestnut, Gallatin County; Howard N. Stockett, Stockett, Cascade County; Michael Finnan, Roundup, Fergus County; Richard Richards, Roundup, Fergus County; George N. Griffin, Roundup, Fergus County; John S. Davis, Roundup, Fergus County.

The following were granted certificates of competency for having served in the capacity of foreman for the same person, company, or corporation, one year prior to the approval of the act creating the Board of Examiners:

James Fleming, Bear Creek, Carbon County; Peter Pryde, Bear Creek, Carbon County; Mark Lantz, Red Lodge, Carbon County; Amer A. Rawlins, Coalville, Carbon County; William Good, Washoe, Carbon County; George S. Killorn, Fromberg, Carbon County; Antone Columbus, Red Lodge, Carbon County; William Maxey, Chimney Rock, Park County; William Pollard, Electric, Park County; Thomas H. Harrison, Storrs, Gallatin County; John Rothwell, Sand Coulee, Cascade County; Charles Lochray, Sand Coulee, Cascade County; John Hane, Belt, Cascade County! Mason Albott, Belt, Cascade County; Patrick O'Neill, Belt, Cascade County; William Orr, Belt, Cascade County; Thomas Orr, Belt, Cascade County; Matt. Richardson, Armington, Cascade County; Frank Calone, Belt, Cascade County; Timothy Carrity, Belt, Cascade County; John N. Pearce, Sand Coulee, Cascade County; Mike Jacobson, Stockett, Cascade County; Harry Kerr, Stockett, Cascade County; William Stainsby, Sand Coulee, Cascade County; Charles Cornish, Roundup, Fergus County; M. H. Fletcher, Roundup, Fergus County; Bert McCurley, Miles City, Custer County; Nicholas Votz, O'Fallan, Custer County; D. M. Elder, Miles City, Custer County.

The following took the examination and secured the required percentages and were granted Certificates of Competency:

James Castle, Washoe, fire boss or mine examiner; Alexandre Longstaff, Bear Creek, fire boss or mine examiner; Evan Jones, Red Lodge, fire boss or mine examiner; W. W. Owen, fire boss or mine examiner; John Lindsay, fire boss or mine examiner; John Sanderson, Bridger, mine foreman; John M. Anderson, Red Lodge, mine foreman; Richard Price, Washoe, mine foreman; William Currie, Bridger, mine foreman; James Milldown, Bear Creek, mine foreman; Nathan Brooks, Red Lodge, mine foreman; Raymond Echle, Hoffman, fire boss or mine examiner; John Stewart, Aldridge, mine foreman; Arthur Stevenson, Chimney Rock, mine foreman; Thomas Orr, Storrs, fire boss or mine examiner; William Jenkins, Chimney Rock, fire boss or mine examiner; Thomas C. Dickson, Chestnut, fire boss or mine examiner; John Leslie, Stockett, mine foreman; George Wilson, Stockett, mine foreman; William Navin, Stockett, mine foreman; M. J. McCabe, Stockett, mine foreman; E. F. Dugan, Roundup, mine foreman; Charles Yost, Roundup, mine foreman; Archie Anderson, Roundup, mine foreman; Nathan Smethurst, Roundup, mine foreman; Roger E. Davis, Roundup, mine foreman; John Bailey, Roundup, mine foreman; John Dunn, Roundup, mine foreman.

There were two that failed to receive the required percentage: Michael N. Wasisco, Red Lodge; Martin Feesum, Sand Coulee.

Members of the Board of Examiners.

Thomas Good, Thomas Conway, J. B. McDermott, Carbon County; Charles Taylor, Edmund A. Bartl, George Frosyth, Gallatin County; Thomas J. Evans, William Ralph, Park County; Michael Finnan, Robert Hendry, Fergus County; James Pearson, Timothy Garrity, Cascade County; Thomas Gibbs, D. M. Elder, Custer County; John Gibbons, F. F. Bossuot, Chouteau County.

In our report to your office for 1909 we complained of the abuse of, and suggested that the wisdom of allowing text books at examinations, was hardly appreciated, would say that the Boards upon their second meetings, restricted the use of the same, except for use of formulas to work out problems pertaining to mining.

I believe that our actions was approved even by the candidates as the examinations are for the purpose of ascertaining the candidates knowledge of mining, not how good he is at copying.

We trust that your message will advocate the re-imbursement of those members that acted with the Board of Examiners, advancing their own expenses, and that per diem allowed by law will be at the next session of the legislature appropriated for the payment of same.

Names of those who have taken the examination and successfully passed and were granted Certificates of Competency for mine foreman, fire boss, or mine examiner since November 30th, 1909, up to November 30, 1910.

John P. Gibson, Red Lodge, Mont., fire boss or mine examiner; Thomas Freeman, Red Lodge, Carbon Co., mine foreman; Abe Douglass, Red Lodge, Carbon County, mine foreman; Thomas Barrett, Red Lodge, Carbon County, mine foreman; Charles J. Evans, Red Lodge, Carbon County, mine foreman; David Lewis, Red Lodge, Carbon County, mine foreman; Thomas C. Dickson, Chestnut, Gallatin County, mine foreman; Thomas Orr, Chestnut, Gallatin County, mine foreman; Charles Taylor, Chestnut, Gallatin County, mine foreman; William Holland, Roundup, Fergus County, mine foreman; D. W. Davis, Harlowton, Meagher County ,mine foreman; Thomas Herbert, Lewistown, Fergus County, mine foreman; Robert Hendry, Lewistown, Fergus County, mine foreman; William Dempster, Aldridge, Park County, mine foreman; John Fergus, Livingston, Park County, mine foreman; Joseph Bailey, Hoffman, Park County, mine foreman; Louis Torstovorsnik, Aldridge, Park County, mine foreman; Theodore Brockman, Aldridge, Park County, mine foreman; Casper Gonsor, Belt, Cascade County, mine foreman; H. J. McLaughlin, Sand Coulee, Cascade County, mine foreman; Charles W. Peterson, Sand Coulee, Cascade County, mine foreman; Alex Hynds, Aldridge, Park County, mine foreman.

Service Certificates.

M. E. Hatch, Miles City, Custer County, mine foreman; Thomas Mokka, Sand Coulee, Cascade County, mine foreman; Hugh Brown, Sand Coulee, Cascade County, mine foreman; Louis Dahn, Sand Coulee, Cascade County, mine foreman; H. W. Millard, Belt, Cascade County, mine foreman; R. A. Evans, Red Lodge, Carbon County, mine foreman; James Baxter, Red Lodge, Carbon County, mine foreman; Henry Raeder, Chinook, Chouteau County, mine foreman; H. H. Fritz, Havre, Chouteau County, mine foreman; W. T. Brown, Sand Coulee, Cascade County, mine foreman; J. O. Gilkerson, Lewistown, Fergus County, mine foreman.

Lieu Certificates Granted on Account of Holding Like Certificates.

John S. Lee, Red Lodge, Carbon County, mine foreman; Thomas Good, Washoe, Carbon County, mine foreman; W. H. Franklin, Red Lodge, Carbon County, mine foreman; Charles P. Keyes, Bear Creek, Carbon County, mine foreman; W. E. Pinkney, Coalville, Carbon County, mine foreman; William Scott, Roundup, Fergus County, mine foreman.

Louis Warhover, Red Lodge, Carbon County, failed; Mike Hudak, Red Lodge, Carbon County, failed; Hugo Olsen, Big Sandy, Chouteau County, failed.

Samuel Barrett, application for examination, Red Lodge, Carbon County.

Ralph Wilson, Sand Coulee, applied for Service Certificate, paid fee $5.00. James Latham, applied for Service Certificate, paid fee $5.00 Sand Coulee.

There was remitted to the State Treasurer for Certificates, $195.00; four applications at $2.00, $8.00; total, $203.00.

RECOMMENDATIONS FOR LEGISLATIVE ACTION.

At a meeting of the Mine Inspectors' Institute of U. S. of A., held in Chicago, Ill., June 1910, a committee of five, on Uniformity of Coal Mine Laws—of which the State Coal Mine Inspector of Montana was a member—reported to the institute, and which was unanimously adopted by them and the committee enlarged and continued the following recommendations, which with other recommendations, we respectfully submit to you for your approval and endorsement and hoping that any of the suggestions that are offered, that appeals to you, may find the willing ear and active co-operation of our legislators and become part of the Codes for the government of one of our chief industries—that of Coal Mining.

The establishment in each coal producing state of a department of mines. In case the department is in charge of a chief, determination of his qualifications to make him eligible to fill the position.

The determination of the degree and proof of competency and other qualifications, to be furnished by all persons desiring to fill the office of mine inspector. The selection of mine inspectors to be governed by merit and the evidence of ability.

2. Mine maps to be made for each seam worked. Mapping

to be done on a uniform scale. Mine surveys to be made, and extensions to be made at stated periods, not more than six months apart, the correctness of said surveys and extensions to be certified to by the engineer or surveyor making the same. The elevations of the mine workings at given distances and at all essential points to be recorded on the maps, also the location of oil wells and gas wells ,the division lines between the coal properties together with all other data that may be of value in the protection of property and life.

3. Provisions for the opening of new mines with regard to escapes, equipment, safety devices, etc.

4. Provisions for the establishment and maintenance of traveling ways, escape roads and safety chambers.

5. Provisions for the installation and use of electricity in mines.

6. The method of ventilating mines, air volume required, the establishment of splits and such other provisions needed to maintain the mine and the mine workings in a healthful and safe condition.

7. Designation of the person who shall have control and direction in the use of the ventilating apparatus.

8. Provisions for fire protection inside and outside the mines by means of a high pressure water supply and the use of chemicals.

9. Provisions for the use of non-combustible material in shaft lining, bottom construction, mine stables and other underground places where danger from fire exists and in the construction of outside buildings at or adjacent to the mine openings.

10. The installation of telephones in mines.

11. Provisions for dealing with coal dust in mines in order to lessen the danger arising therefrom and the providing of means for the maintenance of a fairly high and uniform mine temperature.

12. Explosives in mines, their use, provisions for the preparation and firing of shots.

13. Provisions covering oil, lights and safety lamps in mines.

14. Directions for mandatory mine rules, supplementary to and in conformity with prevailing state laws, intended to promote the safety of the mine workers and lessen the occurence of mine accidents.

15. The establishment of a standard of competency for mine foremen, required proof of their ability and qualifications, definition of their duties, powers and responsibilities and a provision for their suspension or removal for cause.

16. Requirements of the mine operator to furnish all needed means and supplies intended for the miners' use and protection, in an adequate and sufficient measure.

17. The establishment of a proper method of mine discipline. Provisions covering timbering, the general examination of mines and the inspection of the working places with directions for maintaining them in a safe and healthful condition.

In addition to those recommendations of the Institute, I hereby submit the following:

Provisions for opening up and filling in cross cuts, in rooms and entries, distances apart, and of what material they should be closed with.

Provisions for penalties for opening out rooms and entries inside of cross cuts; also for quality of oil used in coal mines, providing tests for same.

Provisions for notification, by phone or wire, of a serious accident in or about the coal mines, to keep intact the place where workmen was injured or killed, fencing off, until the Coal Mine Inspector makes an examination of same.

No.'s 15 and 17 of the Institute's recommendations might be added to and enlarged in regard to the fire boss or mine examiner, miner, and all others connected with the operation of a coal mine, by defining by law, qualifications and duties of each man employed.

Provisions for a Code of Signals for Coal Mines, for shafts, slopes, rope haulage; provide for printing Uniform Poster, on durable linnen so there would be no difference, uniformity both as to size and signals.

Provisions making it compulsory for Coroner or Acting Coroner, to date and hold inquest on any and all bodies of those fatally injured and killed in and around the coal mines, when the State Coal Mine Inspector can be present and offer testimony.

Provisions for stretchers, blankets and a suitable first aid cabinet, splints, bandages, oils, medicines, etc., providing for the number required and where kept, in and around coal mines.

Provisions for Barrier Pillars between properties for safety for miners against fire, gas, water, etc., also for protection of adjoining property.

Provisions for openings to the surface in advanced workings; on account of ventilation required in coal mines, the first two openings are necessarily not far apart, with compulsory measures, for safety chambers in all mines, at once, provide for escapes nearer the working faces in all mines now opened and others that may be opened by prescribing distances apart and time allowed for completion of such escape ways.

Provisions making it compulsory upon mine operators to furnish all data and statistical information, within reasonable time, of the operation of the mines under their charge or control to the State Coal Mine Inspector, when requested to do so.

Provisions for a Deputy Coal Mine Inspector at a salary of two thousand five hundred dollars per year and all and necessary traveling expenses.

In the older coal mining countries, particularly, England, commissioners are appointed representative of the industries involved and conduct experiments, discuss the different phases of coal mining, offer suggestions for the betterment of the industry and suggest methods, rules and laws for the government of properties and employees engaged therein; some of those commissions have been in session, many years, meeting from time to time as conditions suggested and warranted, and the benefits derived from those meetings are apparent to all interested observers.

I would suggest, that irrespective of the action taken by the incoming Legislature upon recommendations for additions thereto or amending of our present mining laws, the appointment of a Commission for investigation of mining conditions, laws, rules and usages of all mining and milling industries in this state; provide ample means and facilities for carrying on the work; be liberal with an appropriation for this purpose.

It seems to me, while we are making frantic efforts to encourage the settling up and upbuilding of this great State, so prolific in natural resources—and we are all agreed upon that—we migh pause long enough to consider the wants and needs of those that are with us.

No doubt, from just such a Commission we will receive suggestion for legislation, laws that will protect mining, not prohibit, encourage, not destroy.

Montana ranks with top notchers, if not at the top in copper, cattle, and sheep industry; ranks very high in raising wheat, oats, rye, flax, barley, alfalfa, potatoes and apples, in fact anything that will grow at all in other states seems to thrive in Montana.

The educational tests for teachers in Montana is among the highest; the strictest examinations for diplomas for doctors and lawyers obtain in Montana.

Let us consider carefully the mining laws and conditions of this and other states, and if we do not set a pace for other states to emulate, at least be on the same plane as they.

YELLOWSTONE COUNTY.

Republic Coal Company, Klein, operated their mine No. 2 in 1909 about 150 days employing 100 miners; 44 inside daymen; 35 outside daymen; and produced 43,994 tons of coal; the R. R. grade, steel gallows frame, self dumping cages, engines, boilers, modern up-to-date mine sunk and equipped during this period.

In 1910-period the mine operated 260 days; employing 225 miners; 55 inside and 50 outside daymen and produced 359,546 tons of coal.

The mine has installed a Holmes lift and a car puller is now being put in. On the surface a new Cappel fan was installed a 16'x6' to ventilate the mine. A machine shop 50'x28' has been built of native stone; a brick oil house 14'x22' in size has been built; a mine office 14'x20' built; 50 new dwellings for miners erected.

Davis Coal Company, near Roundup, operated their mine during 1910 period about 200 days; employing at present 86 miners, 21 inside and 42 outside daymen; produced 18,541 tons of coal; slope and air course sunk; engine and engine house tipple, fan, office buildings, dwellings for employees installed and erected during this time and as reported without details—"a complete outfit installed" and bids fair to become one of the big producers of coal.

CARBON COUNTY.

Northwestern Improvement Company, Red Lodge, operated their mines in 1909-268 days, employing 4 machine operators and helpers; 8 loaders! 640 miners; 225 daymen inside and 176 daymen outside; and produced; 739,302 tons of coal; there were 11 fatal accidents and 12 non-fatal accidents reported.

During 1910-period, the mines operated 235 days; employing 669 miners, 217 inside daymen, 153 outside daymen; produced 838,526 tons of coal. There were 5 fatal and 17 non-fatal accidents in and around their mines during this period.

The improvements installed, in the language of the General Superintendent was:

At the West Side Mine completed, installing tipple and box car loader; this is the type that loads by gravity, elevating either end of the box car. Installed refuse tramway, two electric hauling locomotives; extended slope and are driving tunnels on 2nd and 3rd levels between No.'s 1½ and 2 veins; making a total of 960 feet of rock tunnels at this time; (Oct. 31, 1909). At East Side Mine, installed a pair of 28"x48" hoisting engines at No. 4 slope.

Built an up-to-date wash house for miners, with hot and cold water and shower baths, toilet etc.

Built a new fan house at 1½ air way and moved fan from No. 2 slope to this airway.

(This was contemplated and spoken of by me as one of the aims of the Superintendent, when the fire broke out in No. 2 slope, Nov. 20, 1909. Had this improvement been placed before the fire the story would have been different.)

Put in pipe line for fire protection, with a number of hydrants at various points on the surface, as well as pipe lines with stand pipes on No.'s 2 and 4 slopes, all connected with City Water pressure, assuring a good force of water at all times, day and night.

No. 1½ slope and main airway have been extended 550 feet.

Rock tunnels have been driven from 3rd West Back entry on No. 2 vein to 1½, improving conditions for ventilation and giving an extra travelway for the men in case of necessity.

From No. 4 vein, 5th level, 800 feet of rock tunnels have been driven towards No.'s 5 and 6 veins.

On 8th level, No. 4 vein, a rock tunnel has been driven on a pitch of 45 degrees towards No. 2 vein. The object to give an escape way from the bottom of the workings from No.'s 2 and 4 mines.

During the past year, all entries and airways have been pushed and driven double shift, there having been driven during this period over 5 miles of main and 5 miles of back entries, which has opened up ground for about Two Million Seven Hundred Thousand Tons of Coal.

Especial attention has been given to sealing up of old workings, in a substantial manner, all wooden overcasts have been removed and replaced by overasts built principally of concrete and steel.

The cross cuts between the slope and airway on No. 4 slope, have all been cleaned out and log stoppings built, filling in with sand and faced with concrete, all stoppings that are made of cross cuts between entries are made of logs with sand falling.

The air way along the old fire wall is being filled up with sand rock and sand and silted with water, to make it pack tight and it is having the effect of shutting off the supply of oxygen that kept the fire burning, it also strengthens the slope, for this is practically as good for support as the original deposit.

Here is the story from the same Author for the 1910 period: Underground: 1½ mine, east side, entries and airways have been driven for an output of 300 tons daily at which point we stopped this mine on account of light demand for coal. This mine has extra good walls and can be started on short notice in case of an improvement in coal market.

No. 2 East Side mine; main slope and airway have been extended 1,000 feet during the last year and three pairs of entries turned, making a total of 6 pairs of entries on No. 2 slope, all being driven double shift.

No. 4 mine: Rock tunnel from 8th level to No. 2 vein has been completed on 45 degree pitch; same is equipped with stairway and hand railing. This was driven so as to have a safe travelway near bottom of each mine.

No. 4 slope and main airway are being extended from 8th to 9th level. On the 5th level, 4 vein, rock tunnels have been completed to No.'s 5 and 6 veins and at this point have driven 1,500 feet of double entires without turning any rooms.

During the last year we have placed 10,000 feet of water pipe on dry entries. Very little improvements have been necessary on the outside at East Side mines, except installing a new 330 H. P. boiler. Installed Six Draeger Oxygen Helmets.

1½ West Side Mine: Slope and airway has been extended from 3rd to 4th level, 700 feet; at which point 800 feet of entry and airway has been driven and are now driving rock tunnels for haulage and ventilation to No. 2 vein. 500 feet of said rock tunnels have been driven. Installed two electric hauling locomotives and an electric driven pump. On the outside installed a Sirocco fan and same is giving extra good service.

No. 5 mine, West Side: A slope and airway has been driven to a depth of 1,000 feet at which point we are driving entries. An electric driven pump has been installed at the level.

Mine is ventilated with a 6' electric driven fan which will be replaced with a steam driven fan as the mine develops.

A pair of 24"x36" hoisting engines will be set up for this mine next summer.

In general we have pushed our narrow work at about the same rate as last year and have everything in good shape for a large output if same should be required.

Montana Coal and Iron Co., Bear Creek, operated their mine during 1909 a period of 179 days; employing 90 miners, 12 inside and 12 outside daymen; produced 56,999 tons of coal; there were 3 non-fatal accidents reported. There was considerable activity in the way of improvements going on around this plant during this period; the tipple was rebuilt and raised about 11 feet which brought the tipple on a level with the second opening. A trestle for a distance of about 300 feet was built with two elevations, one for the loaded cars coming from the second opening on a grade of 1½% which carries the same with ease and safety to the scale level. After the cars are dumped they run forward onto a kick-back which sends them to an empty car haul after which they are delivered to a second elevation and are then carried by gravity to the opening from which they were loaded.

From No. 1 opening they have installed a car haul for the loads, about 40 feet in length, which brings the loads up an incline to the level of the scale platform and the cars are dumped and diverted to either opening desired.

Shaker screens, tandem form were installed for screening and making the different sized coals for an exacting market. To operate this machinery a Westinghouse Electric Motor was installed. A Phillips cross over dump was put in; also a chute was built to coal the engines of the Yellowstone Railway Company.

In 1910, the mine operated 153 days; employing 4 machine operators; 14 loaders; 90 miners; 15 inside and 14 outside daymen, and produced 49,548 tons of coal; 2 non-fatal accidents were reported; enlarged tipple by building bins on the east side for storage of nut coal, installed a revolving screen for better preparation of all the nut coal; installed an electric locomotive and two mining machines.

Built an aireal tramway, two bucket system, for hauling away the waste slack.

They report idle time on account of car shortage and the miners were on strike for about two months during the period of construction; everything is running along smoothly at the present time.

Jolliet Coal & Fuel Co., mine about 3 miles from Joliet, operated during 1909 period, 200 days; employing 3 miners and 1 outside dayman; produced 2,355 tons of coal; no accidents; no improvements.

No report of production for 1910 period.

Bituminous Coal Company, Coalville, reported operating during 1909 period, 231 days; employing 6 machine operators and helpers; 18 loaders; 42 miners and produced 27,506 tons of coal; 2 minor accidents were reported; wash house was built during this period; an electric lighting plant installed to light up the growing city of Fromberg.

In 1910 period the mine operated 260 days; employing 6 machine operators and helpers; 11 loaders; 50 miners; 22 inside and 13 outside daymen; and produced 36,042 tons of coal; built a new wash house—the other burned down—was about the extent of improvements; there were 3 non-fatal accidents reported.

Bridger Coal & Improvement Company, Bridger, operated their mine during 1909 period, 139 days; employing 30 miners; 14 inside and 18 outside daymen; and loaded 14,752 tons of coal; no accidents reported; re-setting power house boilers and erecting new stack were the improvements.

Bridger Coal & Improvement Company operated their mine in 1910, 201 days; employed 20 miners; 11 inside and 16 outside daymen; produced 18,571 tons of coal; one accident reported; new slope and prospect entries are being pushed, which if the coal proves satisfactory, will greatly diminish the long haul of coal from the mine to the tipple.

Smokeless & Sootless Coal Company, Bear Creek, mine operated during 1909 period, 272 days; employing 30 miners; 6 inside and 10 outside daymen; produced 17,188 tons of coal; installed power house and machinery re-modeled tipple and screens; sunk through the country rock to No. 3 vein.

In 1910 period the mine operated 224 days; employing 4 machine operators; 20 loaders; 8 inside daymen; 10 outside daymen; and produced 15,656 tons of coal; reported mine idle 30 days account of car shortage; 60 days, no orders for coal; had a strike of 2 days duration; was idle 7 days on account of cavein on slope; installed an electric driven fan; triplex pump and 2 new mining machines; one non-fatal accident reported in 1910.

Bear Creek Coal Company, Bear Creek, operated their mine during 1909 186 days; employing 24 miners; 8 machine operators; 50 loaders; 15 inside and 11 outside daymen; loaded 81,293 tons of coal; there was one fatal and 3 non-fatal accidents in this mine during this period.

In 1910 period, mines operated 174 days; employing 8 machine operators; 65 loaders; 34 miners; 34 inside daymen 18 outside daymen and loaded 74,802 tons of coal; there were 5 non-fatal accidents reported; installed electric slack hoist; concreted floor of wash house and installed shower baths ;installed one 7½ tons electric motor and electric car-haul to No. 4 mine.

Carbon Coal Mine, Killorn & Weber, Leasors, Fromberg, operated their mine during 1909 period, 139 days; employing 10 miners; 2 inside and 1 outside daymen, produced 7,611 tons of coal; no accidents or special improvements.

In 1910 period the mine operated about 250 days; with about 15 men inside and 5 outside and produced 11,207 tons of coal. There was installed at this plant during this period one 100 h. p. boiler, one Sullivan compressor, two undercutting post puncher mining machines.

This plant has been handicapped somewhat in the past on account of the team haul of the coal, this of course was an extra expense over coals that are dumped direct from the mine into the R. R. Cars.

The coal required considerable powder to break it down from the solid and this method of mining has its draw backs and those connected with this mine, all being practical coal mining men saw that to stay and successfully compete in the markets with others not so handicapped have undertaken to put in a switch to the mine and eliminate the team haul; the mining with post puncher machines is proving a success and in proof of this their coal is marketed after shipment of over 300 miles by rail within a stones throw of one of the largest producing mines in Montana.

Washoe Copper Company (Coal Dept.) Washoe, operated their mines during 1909 period, 321 days; employing 110 miners; 50 inside daymen and 30 outside daymen; produced 100,123 tons of coal. There were 4 non-fatal accidents reported; installed two 125 h. p. boilers and boiler house; driven their No. 2 slope from the surface and through No.'s 1 and 2 veins; it is the intention to develop on the No. 2 vein extensively.

The roof overlying the No. 1 vein is very poor, requiring considerable timbering, the experiments conducted in the No. 1 mine proved to those in charge that at present it would be more profitable to confine their efforts to No. 2 vein. The R. R. Grade was extended up to No. 2 mine during this period; the building of a new tiple at No. 2 has commenced, and everything bids fair toward having a large producing mine in No. 2.

In 1910 period, No. 1 mine operated 57 days; No. 2, 215 days; and the production, with 85 miners, 35 inside and 25 outside daymen was 106,792 tons of coal; there was one fatal and 4 non-fatal accidents; there was installed 2 boilers 150 h. p.; a 7.5' Stevens fan; 1 Litchfiel hoisting engine at No. 2 mine.

International Coal Company, Bear Creek, operated their mine during 1909 period, 195 days; employing 51 miners, 10 inside and 17 outside daymen; produced 49,736 tons of coal; there were 2 non-fatal accidents reported; four 80 h. p. boilers, generator, box car loader, shaker screens, water system, coal conveyors, etc., were installed during this period.

Furnace fire died out and in its stead an electric driven fan was installed.

The company are at this time experimenting with different types of mining machines, for undercutting the coal.

In 1910 period the mines operated 189 days; employing 6 machine operators; 52 loaders; 18 miners; 12 inside and 15 outside daymen, loaded 46,285 tons of coal.

There were 4 mining machines installed in the mines to undercut the coal; one electric hoist put in on the No. 3 slope which was sunk during this period. There was 1 non-fatal accident reported.

CASCADE COUNTY.

Cottonwood Coal Company, Stockett, operated their mines during 1909 period 243 days; employing 104 machine operators and helpers; 142 loaders; 109 inside and 101 outside daymen, produced 549,601 tons of coal there were two fatal and one non-fatal accidents reported.

The following were among some of the improvements put in in their plant:

Two hanging fire box boilers, 125 h. p. each. The trestle leading up to dump, double tracked. An engine was installed and a new system put in to feed the coal to tipple.

No. 6 mine was opened up during this period; this mine is located about 2 miles southeast of the haulage plant; work was commenced on this new mine, on April 15, development work was done at the mine by Harrison mining machines, in fact the Stockett mines, are strictly mining machine mines, no pick miners being employed to mine coal, all undercutting being done by punchers; the snow fell on the machine operator at the opening of No. 6 mine. The air was conducted from the main power plant to No. 6 mine by a temporary 4" pipe line; the grade for rope haulage was completed September 15tn, 1909. From this time on the production of the mine was 500 tons per day and over. There has been installed at No. 6 mine, a fan engine and fan; one 50 h. p. boiler; small hoisting engine to handle the mine cars; stable for stock, 16'x60'; wash house for the use of the miners.

This plant is operated by the same haulage engines that pull the cars from No. 5 mine. A trip of 80 to 90 mine cars moved from the innermost workings of the mine and landed on the dump with ease.

The Stockett mines were the first in this State, to install Telephones in their mines, communication is established between each double parting in the mine and the tipple, and office of the Superintendent.

In 1910 period the mines operated 216 days; employing 116 machine operators and helpers; 152 loaders; 88 inside daymen; 114 outside daymen; produced 481,429 tons of coal; there were reported 1 fatal and 2 non-fatal accidents; no special improvements during 1910.

Oregon & Montana Coal Company, Sand Coulee, mine operated during 1909 period, 227 days; employing 16 miners; 2 inside and 1 outside daymen; produced 2,254 tons of coal; no accidents reported; entries pushed forward; ditching and installation of engine and pump were the improvements reported.

In 1910 period the mine operated 225 days; employing 6 miners; 1 inside and 2 outside daymen, produced 3,310 tons of coal; trestle work from the end of the old dump was extended to R. R. track during this period; no accidents reported.

Jimmie Hope Mine, Belt, operated in 1909 period, 190 days; with 4 men, produced 1,903 tons of coal; no accidents; no special improvements, other than cleaning up air-courses and getting ready for a good winter's run.

In 1910 period, 300 days; with 2 men and produced, 1,874 tons of coal no accidents; no special improvements reported.

Richardson Mine, Armington, operated during 1909 period, 217 days; employing 2 men; produced 844 tons of coal; in 1910 mine operated 70 days; employing 2 men, produced 225 tons of coal; no accidents reported nor any special improvements during those 2 years.

Lakeside Coal Company, Sand Coulee, mine operated during 1909, 220 days; employing 12 miners; 2 inside, 4 outside daymen; produced 8,071 tons of coal; an air shaft was sunk; a 5 h. p. engine installed to hoist the coal from the mouth of the drift to the tipple on the side hill; new steel cable put on; powder house built.

In 1910 period the mine operated 209 days; employing 16 men, produced 13,043 tons of coal; installed engine, fan and pump. No accidents.

Stainsby-Latham Coal Company, Sand Coulee, operated their mine during 1909 period, 263 days; employing 22 miners; 3 inside and 4 outside daymen; produced 24,458 tons of coal; no accidents reported; built trestle about 160 feet across County road from Chute to R. R. cars and also opened out on the south side of the mine for air.

S. L. C. Co., in 1910 period the mine operated 223 days; employing 22 miners; 4 inside and 4 outside daymen; produced 26,952 tons of coal; one non-fatal accident reported; no special improvements.

Lochray Coal Company, Sand Coulee, mine operated during 1909 period, 200 days with 3 miners and produced 1,609 tons of coal; in 1910 period the mine was operated 115 days; employed 3 men inside 3 men outside and produced, 1,957 tons of coal; during this period the property has taken on a different air; new chutes were built; new tipple; a spur built from the railroad to the mine. No accidents reported.

Millard & Crane Coal Company, Belt, operated their mine during 1909 period 200 days; employing 2 machine operators; 3 loaders; produced 1,328 tons of coal; no accidents reported; the improvements installed were: One 30 h. p. boiler; one 25 h. p. engine; air line and compressor; one Sullivan coal puncher machine; dug ditch for drainage 200'x2'x5'.

In 1910 period the mine was operated 300 days; employing 2 machine operators; 2 loaders; 1 outside dayman, produced 2,421 tons of coal; no special improvements; no accidents.

Nelson-Jenks Coal Company, Sand Coulee, operated their mine during 1909 period, 254 days; employing 32 machine operators and helpers; 54 loaders; 30 miners; 65 inside and 27 outside daymen; loaded 2,182,590 tons of coal; there were 4 non-fatal accidents reported; installed during this period 2,000 feet of rope haulage in the mine.

1910 period the mine operated 246 days; employing 32 machine operators and helpers; 47 loaders; 11 drillers; 40 miners; 48 inside and 33 outside daymen produced 172,559 tons of coal; there was one fatal accident reported; no special improvements.

Ed. Gerber Coal Company, Sand Coulee, operated during 1909 period 230 days, employing 31 men; produced 49,250 tons of coal; there were 4 non-fatal accidents reported; a new drift was opened up on the property.

In 1910 period the mine operated 217 days employing 4 machine operators; 53 miners; 11 inside and 11 outside daymen and produced 63,436 tons of coal; the accidents reported were 2 non-fatal; tail rope haulage was installed from the mine to the tipple; this eliminates the haulage with horses as heretofore.

Anaconda Copper Mining Company, Belt, operated their mine in 1909 period 213 days; employing 24 machine operators; 75 loaders; 39 miners; 65 inside and 62 outside daymen; produced 162,974 tons of coal; 2 non-fatal accidents reported; no special improvements.

In 1910 period the mine was operated 226 days; employing 28 machine operators and helpers; 72 loaders; 19 miners; 59 inside and 64 outside daymen and produced 148,068 tons of coal; there were 2 fatal accidents during this period; no special improvements.

Fred Schmauch Coal Co., Belt, operated their mine during 1909 period 308 days; employing 8 men and produced 6,009 tons of coal; no accidents; dug a ditch and drove a tunnel to syphon the water out of the mine.

In 1910 period the mine operated 300 days; with 10 men and produced 7,676 tons of coal; no accidents; no improvements.

Louis Dahn Coal Co., mine operated during 1909 period 100 days; employing 8 men and produced 1,232 tons of coal; no accidents; no improvements.

In 1910 period the mine operated 120 days; employed 10 men and produced 3,780 tons of coal; no accidents; drove an air tunnel to surface.

Nicholson Brothers, Stoekctt, operated their mine in 1910 period 200 days, employing 2 men; produced 914 tons of coal; had side track put in to mine and built narrow gauge from mine to R. R. cars.

Armington Mine operated in 1909, 135 days with 2 men and loaded 676 tons; operated in 1910, 250 days with 2 men, produced 750 tons; no accidents.

CUSTER COUNTY.

Custer County Coal Co., Fallon. This mine reported operating 200 days in 1909 employing 6 miners; 2 inside daymen and 4 outside, produced 3,000 tons of coal.

The improvements consisted of installation of one 40 h. p. engine and boiler; one 16 h. p. engine and boiler; commissary and mess house and bunk houses for the miners employed.

No report received for 1910 period.

Bert McCurley, near Miles City, reported operating his mine 125 days in 1909; employing 2 miners and produced 311 tons of coal; no accidents; no special improvements; no report for 1910.

Kircher Coal Co., Miles City, reported operating their mine in 1909, 300 days; employing 4 miners; one inside and 1 outside daymen and produced 4,044 tons of coal. No accidents; an airshaft was put through for air during this time.

In 1910, the mine reported operating 200 days employing 4 miners; 1 inside and 1 outside daymen and produced 3,350 tons of coal; no accidents; no special improvements.

VALLEY COUNTY.

Astrope mine reported operating his mine, north of Culbertson, in 1909, 273 days; and produced 249 tons of coal; no accidents; no improvements. In 1910 operated the mine 62 days; produced 331 tons of coal; no accidents; no improvements; natural ventilation.

Onstad mine in Coalridge, operated in 1909, 300 days; employing 3 men; and produced 1,501 tons of coal; no accidents reported; enlarged airshaft and built stack on it and timbered up the mine in good shape.

In 1910 period operated the mine 300 days; employing from 1 to 4 men and produced 2.077 tons of coal; general repairs were prosecuted inside and outside of the mine for its betterment.

Shorty Young's mine located near Medicine Lake, operated during 1909, 313 days; employing 2 men and produced 992 tons of coal; mine in good shape, natural ventilation, no accidents, no improvements.

In 1910 period mine operated 220 days; employing 2 miners; produced 1,220 tons of coal.

Zeno-George Mine in Culbertson, operated during 1910 period 150 days; employing 3 men, and loading 390 tons of coal; no accidents; no improvements; natural ventilation.

Dempsey, Cooper, Richardson Mine not reporting production to this department for this period.

CHOUTEAU COUNTY.

Burns coal mine located 4 miles south of Chinook; mine operated about 100 days, (1909); employink 3 men; produced 688 tons coal; no accidents reported; sunk an air shaft; built a bunker to hold coal, 30 tons.

In 1910 period the mine operated 112 days; employing one miner; produced 338 tons of coal; no accidents; no improvements.

The Macton Coal Co., south of Big Sandy, operated during 1909, 310 days; employing 7 miners and 6 outside daymen, and produced 4,542 tons of coal; no accidents reported; installed a

5 h. p. engine and fan and built a bunk house for employees, conditions fair.

In 1910 period the mine operated 162 days; employing 13 men and produced 1,999 tons of coal; no production reported since April 1910, the Macton Co., having leased the mine to some Butte parties.

Raeder Mine, near Chinook, operated during 1909, 60 days; employing 1 miner and produced 91 tons of coal; an air shaft was sunk during this time.

In 1910 period the mine operated 42 days; with 1 miner and produced 125 tons of coal; a new tipple was built; natural ventilation.

Milk River Coal Co., near Chinook, operated their mine dnring 1909, 300 days; employing 14 men and producing 4,239 tons of coal; no improvements; natural ventilation.

In 1910 period the mine was operated 310 days employing 20 men and loading 3,840 tons of coal; an air-shaft, exhaust fan and tipple are the improvements reported; no accidents.

Mack Mine, near Big Sandy reported operating about 150 days in 1909 and employing 2 men and producing 528 tons of coal; in 1910 employed 2 men and produced 775 tons of coal; no accidents; no improvements; natural ventilation; conditions good.

Havre Coal Mining Company, mine near Havre, operated in 1909, about 200 days; employing 37 men and producing 12,429 tons of coal; in 1910, the mine operated about 300 days; employing 36 men and producing 15,609 tons of coal; no accidents reported; no special improvements.

Staton mine near Havre, operated in 1909, 50 days; employing 3 men and produced 350 tons of coal; built bunker to store coal near town.

No report of production in 1910.

FERGUS COUNTY.

Spring Creek Coal Co., near Lewistown, operated their mine in 1909, 220 days; employing 7 men and produced 3,551 tons of coal; there were considerable improvements installed during the past 2 years at this plant; the improvements were in the neighborhod of $50,000 dynamos, boilers, generators, heaters, feed pumps, engines and switches, etc., built a new modern up-to-date tipple with new screens, bins, chutes with a capacity of 600 tons per day; the style of the firm has changed to Lewistown Coal, Gas & Light Company.

In 1910 period the mine operated 268 days; employing 36 men and produced 10,780 tons of coal completed the installations started the year before; no accidents.

S. G. Rand mine near Moore, operated in 1909, 70 days employing 2 men, producing 121 tons of coal; no improvements; no accidents; mine not operated in 1910.

Hughes mine, Willow Creek, operated in 1909, 140 days; employing 2 men; produced 853 tons of coal; no accidents; no special improvements.

In 1910 the mine operated 305 days; employing 4 men and produced 1,057 tons of coal; no accidents reported; sunk an air shaft 90 feet, were the extent of improvements.

Joe Seman mine, Sage Creek, operated in 1909, about 100 days; with one man and produced 104 tons of coal.

In 1910 the mine operated 313 days; employing 3 men and produced 2,065 tons of coal; no accidents reported; no special improvements.

Black Diamond Coal Co., near Lewistown, operated in 1909 period about 110 days; employed 4 miners; and produced 1,321 tons of coal; no accidents reported; built new roads, new tipple, house, scales put in; new tunnels were started.

Central Montana Coal Co., same proposition, operated in 1909 period 300 days; employing 10 men; produced 3,700 tons of coal; no accidents reported; reports $2,000 spent on improvements generally.

Gold Reef Mining Co., mine was operated during 1909 period, 240 days; employing 3 men and producing 1,577 tons of coal. In 1910 the mine was operated 180 days; employing 3 men and producing 1,689 tons of coal. No accidents reported; no improvements.

Sam Schultz mine, Sage Creek, operated during 1909 period, 180 days; with 1 man and produced 1.079 tons of coal; in 1910 period mine worked 185 days; with 2 men and produced 2,269 tons of coal; no accidents reported; no special improvements.

Keen Coal Company Roundup, operated their mine in 1910 period 325 days; employing 2 miners; produced 1859 tons of coal; no accidents; grading at present time for R. R. switch to the mine; contemplate new tipple, etc.

Sharp Brothers, near Lewistown, operated their mine during 1909, 140 days; employing 5 men and producing 1,400 tons of coal; no improvements; no accidents; mine not being operated during 1910 period.

Republic Coal Co., Roundup, No. 1 mine, operated 276 days in 1909, employing 100 miners; 38 inside and 35 outside daymen and produced 91,999 tons of coal; 2 non-fatal accidents reported; a new up-to-date wash house was built at this mine for the accomodation of the employees.

In 1910 period the production of No. 1 mine is lumped in with the R. C. Co.'s No. 2 mine and this is located in and reported from Yellowstone County. No. 1 mine was abandoned some time ago.

Roundup Coal Mining Company, Roundup, Mine A, operated during 1909, 291 days employing 100 miners; 20 inside and 17 outside daymen; produced 142,514 tons of coal. There was one fatal and 2 non-fatal accidents in this mine during 1909 period.

The Company report: Installation of wash house for miners; tipple engine and power house and miner's dwellings; it was a very busy season trying to operate the mine and dump the coal over a temporary dump and build a new and modern tipple equipped with screens, car hauls, in fact a No. 1 equipment, during all this time the mine was being worked double shift, hoisting coal at night and development in the mine was pushed to its utmost.

In 1910 period the mine operated 259 days; employing 2 machine operators; 10 loaders; 179 pick miners; 34 inside and 24 outside daymen; produced 280,242 tons of coal; no accidents reported; starting in at the grass roots to open up a mine and in 2 years time building a town for employees, installing an electric lighting plant for the town of Roundup; putting in Water works to supply the city, equipping a modern plant, producing right at 500,000 tons of coal, is displaying considerable energy, this the Roundup Coal Mining Company have done, and have not tooted their horn very much at that.

PARK COUNTY.

Anderson & Evans, Hoffman, (Trail Creek) during 1909 period operated their mine 172 days; employing 27 pick miners; 5 inside daymen; 8 outside daymen; total 50 men. Produced 18,906 tons of coal.

In 1910 period there mine was in operation 190 days employing 34 pick miners; 10 inside and 10 outside daymen and loaded 25,452 tons of coal.

The West side of this mine which had been sealed off on account of fire, started supposedly with a box of dynamite exploding, was reopened and the output of the mine is now gotten from the west side.

The mine generally is in pretty good condition; an opening in the smaller vein above the one they are working, where both top and bottom are good, is being driven to the surface and at this time is about completed; this will relieve the fan considerably and will be an easy outlet from the face of the workings as a means of escape should it be necessary.

Montana Coal & Coke Company, Electric and Aldridge, mines operated in 1909, 247 days; employing 6 loaders; 102 miners; 114 inside and 102 outside daymen; produced 83,015 tons of coal; and out of this there was made 38,520 tons of coke, besides furnishing house coal for employees, and engine coal for the use of the company.

There were 10 accidents reported during this period. The mines of the above named company, have been closed, temporarily we hope, for some time, the receiver reported 43,515 tons of coal produced. There were 16,686 tons of coke made from part of this; shipped 1,493 tons; sold to local, 312 tons; and used at the mines 4,191 tons.

There were 4 non-fatal accidents reported; there were no special improvements reported at this time.

Maxey Brothers, Chimney Rock, (Trail Creek) operated their mine 207 days during 1909 period; employing 20 miners; 3 inside and 5 outside daymen; produced 15,564, tons of coal; there were no accidents reported.

In 1910 period they operated the mine 230 days; employing 30 miners; 6 inside and 11 outside daymen; produced 32,308 tons of coal.

There were 4 minor accidents reported. The Maxey Bros. have been and are constantly adding to their plant and steadily increasing the yearly output; in 1906 there were less than 500 tons reported; in 1907 the production reported was, 7,629 tons; 1908 reported 15,520 tons.

Aside from the improvements installed in the mine, machinery, etc., quite a good deal of improvements have taken place on the surface; building houses for employees, and on my last visit there a new school house built for the accommodation of children living in Chimney Rock.

GALLATIN COUNTY.

Harrison Coal Mine, Storrs, operated 110 days in 1909 period; employing 3 miners; and produced 491 tons of coal; no accidents reported. This mine was not in operation during 1910 period.

Evans Mine, Storrs, operated in 1909, 245 days; employed 9 miners; produced 6,950 tons of coal; no accidents; no improvements.

In 1910 period, the mine was operated 198 days; employing 9 miners; 1 inside and 2 outside daymen, produced 6,073 tons of coal; no accidents; no improvements.

Northwestern Improvement Company, Chestnut. Mine operated in 1909 period 313 days; employing 2 miners; 8 inside and 7 outside daymen and produced 8,117 tons of coal; no improvements; no accidents. In 1910 period the mine operated 304 days; employing 20 miners; 4 inside and 8 outside daymen; produced 15,672 tons of coal.

This field is the oldest in the state, kept alive only, during the past two years merely pumping out the water and driving some rock work; the slope was sunk another lift since our last published report and air course enlarged and an electric pump installed.

PRODUCTION BY COUNTIES, 1909 PERIOD.

Rosebud County.

Average number of days mines operated	68
Number of machine operators and helpers employed	
Number of loaders employed	
Number of pick miners employed	12
Number of inside daymen employed	
Number of outside daymen employed	
Black blasting powder used in breaking down coal	551 lbs.
Dynamite used	
Total tonnage coal produced, (2,000 lbs.)	551

Valley County.

Average number of days mines operated ...	298

Number of machine operators and helpers employed	
Number of loaders employed	
Number of pick miners employed	6
Number of inside daymen employed	
Number of outside daymen employed	
Black blasting powder used in breaking down coal	4,202 lbs.
Dynamite used	
Total tonnage coal produced	1,743

Chouteau County.

Average number of days mines operated	170
Number of machine operators and helpers employed	
Number of loaders employed	
Number of pick miners employed	48
Number of inside daymen employed	10
Number of outside daymen employed	16
Total number of men employed	74
Black blasting powder used in breaking down coal	7,825 lbs.
Dynamite used	
Total tonnage produced	22,816 tons

Custer County.

Average number of days mines operated	225
Number of machine operators and helpers employed	
Number of loaders employed	
Number of pick miners employed	12
Number of inside daymen employed	3
Number of outside daymen employed	5
Total number of men employed	20
Black blasting powder used in breaking down the coal	13,500 lbs.
Dynamite used	
Total tonnage produced, coal	7,355 tons

Gallatin County.

Average number of days mines operated	178
Number of machine operators and helpers employed	

Number of loaders employed	
Number of pick miners employed	12
Number of inside daymen employed	
Number of outside daymen employed	
Total number of men employed	12
Black blasting powder used in breaking down the coal	
Dynamite used	50 lbs.
Total tonnage coal produced	7,441 tons

Yellowstone County.

Average number of days mines operated	150
Number of machine operators and helpers employed	
Number of loaders employed	
Number of pick miners employed	100
Number of inside daymen employed	44
Number of outside daymen employed	35
Total number of men employed	179
Black blasting powder used in breaking down the coal	45,000 lbs.
Dynamite used	23 lbs.
Total tonnage	43,994 tons

Park County.

Averages number of davs mines operated	208
Number of machine operators and helpers employed	
Number of loaders employed	6
Number of pick miners employed	159
Number of inside daymen employed	122
Number of outside daymen employed	89
Total number of men employed	376
Black blasting powder used in breaking down the coal	28,700 lbs.
Dynamite used	18,000 lbs.
Total tonnage of coal produced	117,483 tons

Fergus County.

Average number of days mines operated	181
Number of machine operators and helpers employed	
Number of loaders employed	

Number of pick miners employed	225
Number of inside daymen employed	59
Number of outside daymen employed	55
Total number of men employed	339
Black blasting powder used in breaking down the coal	147,346 lbs.
Dynamite used	345
Total tonnage coal produced	245,229 tons

Cascade County.

Average number of days mines operated	193
Number of machine operators and helpers employed	164
Number of loaders employed	276
Number of pick miners employed	174
Number of inside daymen employed	256
Number of outside daymen employed	212
Total number of men employed	1,082
Black blasting powder used in breaking down the coal	342,749 lbs.
Dynamite used	23,550 lbs.
Total tonnage coal produced	996,571 tons

Carbon County.

Average number of days mines operated	238
Number of machine operators and helpers employed	18
Numbers of loaders employed	76
Number of pick miners employed	1,030
Number of inside daymen employed	346
Number of outside daymen employed	292
Total number of men employed	1,762
Black blasting powder used in breaking down the coal	857,325 lbs.
Dynamite used	8,852 lbs.
Total tonnage coal produced	1,098,496 tons

Summary For the Year.

Total number of machine operators and helpers employed	182
Total number of loaders employed	358
Total number of pick miners employed	1,778
Total number of inside daymen employed	840
Total number of outside daymen employed	704

Total number of men employed in and around the mines	3,862

PRODUCTION BY COUNTIES 1910 PERIOD, FROM OCT. 31, 1909 TO OCT. 31, 1910.

Custer County.

Average number of days mine operated	200
Number of pick miners employed	4
Inside daymen employed	1
Outside daymen employed	1
Total number of men employed	6
Black blasting powder used in breaking down the coal	5,000 lbs.
Sold to local	3,308 tons
Used at mines	42
Total coal produced	3,350 tons

One property reporting production.

Valley County.

Average number of days mines operated	186
Number of loaders employed	1
Number of pick miners employed	6
Number of outside daymen employed	2
Total number of men employed	9
Black blasting powder used in breaking down the coal	3,750 lbs.
Sold to local	3,902 tons
Used at the mines	126 tons
Total coal produced	4,018 tons

Four properties reporting.

Chouteau County.

Average number of days mines operated	169
Number of pick miners employed	58
Number of inside daymen employed	5
Number of outside daymen employed	9
Total number of men employed	72
Black blasting powder used in breaking down the coal	25,000 lbs.
Dynamite used	175 lbs.
Shipped	13,292 tons
Sold to local	8,575 tons

Used at the mines	1,119	
Total produced	22,986	tons

Seven properties reporting.

Gallatin County.

Average number of days mines operated	251	
Pick miners employed	29	
Number of inside daymen employed	5	
Number of outside daymen employed	10	
Total number of men employed	44	

No powder used except for rock work.

Shipped	14,511	tons
Sold to local	450	tons
Used at mines	14,901	
Total tonnage produced	29,862	tons

Two properties reporting.

Park County.

Average number of days mines operated	241	
Number of pick miners employed	170	
Number of inside daymen employed	40	
Number of outside daymen employed	103	
Total number of men employed	313	
Black blasting powder used in breaking down the coal	37,500	lbs.
Dynamite used	12,600	lbs.
Shipped	56,762	
Sold to local	1,021	
Used at mines and made into coke	43,486	
Total coal produced	101,269	tons

Three properties reporting.

Fergus County.

Average number of days mines operated	267	
Number of machine operators and helpers employed	2	
Number of loaders employed	10	
Number of pick miners employed	220	
Number of inside daymen employed	45	
Number of outside daymen employed	33	
Total number of men employed	310	
Black blasting powder used in breaking down the coal	207,525	lbs.

Shipped	270,976 tons
Sold to local	22,374 tons
Used at the mines	10,299 tons
Total coal produced	303,649 tons

Eight properties reporting.

Yellowstone County.

Average number of days mines operated	255
Number of pick miners employed	311
Number of inside daymen employed	76
Number of outside daymen employed	92
Total number of men employed	479
Black blasting powder used in breaking down the coal	411,650 lbs.

(Part of this was estimated, properties not reporting.)

Shipped	355,758 tons
Sold to local	1,191 tons
Used at mines	21,138 tons
Total tonnage produced	378,087 tons

Two properties reporting.

Cascade County.

Average number of days mines operated	214
Number of machine operators and helpers employed	182
Number of loaders employed	274
Number of pick miners employed	171
Number of inside daymen employed	226
Number of outside daymen employed	237
Total number of men employed	1,090
Black blasting powder used in breaking down the coal	313,300 lbs.
Dynamite used	21,538 lbs.
Shipped	863,920 tons
Sold to local	32,998 tons
Used at mines	32,677 tons
Total produced	929,595 tons

Sixteen properties reporting.

Carbon County.

Average number of days mines operated	218
Number of machine operators and helpers	28
Number of loaders employed	162

Number of pick miners employed	978
Number of inside daymen employed	357
Number of outside daymen employed	269
Total number of men employed	1,794
Black blasting powder used in breaking down the coal	950,400 lbs.
Dynamite used, (mostly for rock)	18,846 lbs.
Shipped	1,108,713 tons
Sold to local	21,501 tons
Used at mines and wasted	67,216 tons
Total coal produced	1,197,430 tons

Nine properties reporting.

1909 Period—

Summary.

Total number of machine operators and helpers employed	182
Total number of loaders employed	358
Total number of pick miners employed	1,778
Total number of inside daymen employed ...	840
Total number of outside daymen employed ..	704
Total number of men employed in and around coal mines	3,862
Total tonnage produced, during period	2,541,679 tons
Average tonnage, per day, per man employed..	3.4 tons

There was one life lost for every 133,773 tons of coal produced; there was one serious accident for every 42,361 tons of coal mined; there was a serious accident for every 65 men employed; there was one life lost from every 203 men employed; there were 5 men per thousand employed lost their lives; there were 15.5 men per thousand employed, seriously injured.

1910 Period—

Total number of machine operators and helpers employed	212
Total number of loaders employed	447
Total number of pick miners employed	1,947
Total number of inside daymen employed ...	755
Total number of outside daymen employed ...	756
Total number of men employed in and around the coal mines	4,117
Total tonnage produced during period	2,970,246 tons

Average tonnage, per day, per man employed . 3.3 tons

There was one life lost for every 297,025 tons of coal produced; there was one serious accident for every 55,005 tons of coal mined; there was one serious accident for every 76 men employed; there was one life lost from every 412 men employed; there were 2.43 per thousand employed, lost their lives; there were 13 per thousand employed, seriously inffiured.

In 1909 period, there was 51,822 pounds of dynamite used in the mines.

In 1909 period, there was 1,447,270 pounds of black blasting powder used.

In 1910 period, there was 53,359 pounds of dynamite used in coal mines.

In 1910 period, there was 1,954,637 pounds of black blasting powder used.

Accidents in Coal Mines from Octocber 31, 1908 to October 31, 1909.

County.	Date.	Name of Company.	Locality.	Name of Person Injured.	Age	Nationality.	Occupation.	Injured.	Killed	Married	Single	No. of Children.	Cause of Accident. Extent of Injury.
Carbon	Nov. 20, 1908	Northwestern Improvement Co.	Red Lodge	Sam Gasper	21	Italian	Miner		Killed.		Single.		Crib on No. 2 slope caught on fire; asphyxiated from gases generated by fire; killed.
Carbon	Nov. 20, 1908	Northwestern Improvement Co.	Red Lodge	John H. Mattson	40	Finlander	Miner		Killed.	Married		3	Crib on No. 2 slope caught on fire; asphyxiated from gases generated by fire; killed.
Carbon	Nov. 20, 1908	Northwestern Improvement Co.	Red Lodge	Andrew G. Jokela	34	Finlander	Miner		Killed.	Married			Crib on No. 2 slope caught on fire; asphyxiated from gases generated by fire; killed.
Carbon	Nov. 20, 1908	Northwestern Improvement Co.	Red Lodge	Victor Neima	28	Finlander	Miner		Killed.	Married			Crib on No. 2 slope caught on fire; asphyxiated from gases generated by fire; killed.
Carbon	Nov. 20, 1908	Northwestern Improvement Co.	Red Lodge	Andrew Keranen	27	Finlander	Miner		Killed.		Single.		Crib on No. 2 slope caught on fire; asphyxiated from gases generated by fire; killed.
Carbon	Nov. 20, 1908	Northwestern Improvement Co.	Red Lodge	Jack Sinko	30	Finlander	Miner		Killed.		Single.		Crib on No. 2 slope caught on fire; asphyxiated from gases generated by fire; killed.
Carbon	Nov. 20, 1908	Northwestern Improvement Co.	Red Lodge	Frank Yankowski	29	Russian Polish	Miner		Killed.	Married			Crib on No. 2 slope caught on fire; asphyxiated from gases generated by fire; killed.
Carbon	Nov. 20, 1908	Northwestern Improvement Co.	Red Lodge	Toney Sturronis	28	Russian Polish	Miner		Killed.		Single.		Crib on No. 2 slope caught on fire; asphyxiated from gases generated by fire; killed.
Carbon	Nov. 20, 1908	Northwestern Improvement Co.	Red Lodge	Battisto Bessola	18	Italian			Killed.		Single.		Crib on No. 2 slope caught on fire; asphyxiated from gases generated by fire; killed.
Carbon	Nov. 20, 1908	Northwestern Improvement Co.	Red Lodge	John Sandeen				Injured.					Crib on No. 2 slope caught on fire; asphyxiated from gases generated by fire; overcome, revived.
Carbon	Nov. 20, 1908	Northwestern Improvement Co.	Red Lodge	Matt. M. Lecto				Injured.					Crib on No. 2 slope caught on fire; asphyxiated; overcome revived.
Carbon	Nov. 20, 1908	Northwestern Improvement Co.	Red Lodge	Oscar H. Maki				Injured.					Crib on No. 2 slope caught on fire; asphyxiated; overcome revived.
Carbon	Nov. 20, 1908	Northwestern Improvement Co.	Red Lodge	Wm. Haggerty				Injured.					Crib on No. 2 slope caught on fire; asphyxiated; overcome revived.
Carbon	Nov. 20, 1908	Northwestern Improvement Co.	Red Lodge	John Ranagan				Injured.					Crib on No. 2 slope caught on fire; asphyxiated; overcome revived.
Carbon	Nov. 20, 1908	Northwestern Improvement Co.	Red Lodge	Sam Jones				Injured.					Crib on No. 2 slope caught on fire; asphyxiated; overcome revived.
Carbon	Nov. 20, 1908	Northwestern Improvement Co.	Red Lodge	John Flaherty				Injured.					Crib on No. 2 slope caught on fire; asphyxiated; overcome revived.
Carbon	Nov. 20, 1908	Northwestern Improvement Co.	Red Lodge	Albert Kemp				Injured.					Crib on No. 2 slope caught on fire; asphyxiated; overcome revived.
Carbon	Nov. 20, 1908	Northwestern Improvement Co.	Red Lodge	Edward Dean				Injured.					Crib on No. 2 slope caught on fire; asphyxiated; overcome revived.
Carbon	Nov. 20, 1908	Northwestern Improvement Co.	Red Lodge	Mike Leydon				Injured.					Crib on No. 2 slope caught on fire; asphyxiated; overcome revived.
Carbon	Nov. 20, 1908	Northwestern Improvement Co.	Red Lodge	Matt. Huta				Injured.					Crib on No. 2 slope caught on fire; asphyxiated; overcome revived.
Carbon	Nov. 20, 1908	Northwestern Improvement Co.	Red Lodge	John Elich	23	Austrian	Miner	Injured.			Single.		Crib on No. 2 slope caught on fire; asphyxiated; overcome, revived.
Carbon	Nov. 30, 1908	Northwestern Improvement Co.	Red Lodge	Jack Alanko	33	Finlander	Miner	Injured.		Married		4	Gas explosion; face, hands, arms, neck and back badly burned.
Carbon	Nov. 30, 1908	Northwestern Improvement Co.	Red Lodge	Walla Tuska	22	Finlander	Miner	Injured.			Single.		Gas explosion; face, hands, arms, neck and back badly burned.
Carbon	Nov. 30, 1908	Northwestern Improvement Co.	Red Lodge	Oscar Lindgren	24	Finlander	Miner	Injured.			Single.		Gas explosion; face, hands, arms, neck and back badly burned.
Carbon	Dec. 31, 1908	Washoe Copper Co. (Coal Dept.)	Washoe	Mike Boscovitch	32	Montenegro	Miner	Injured.			Single.		Falling roof; fracture femur bone; laceration right eyelid.
Carbon	Dec. 11, 1908	Bituminous Coal Co.	Coalville	Blash Seme	22	Austrian	Miner	Injured.			Single.		Explosives; slight flesh wound on shin.
Carbon	Dec. 11, 1908	Northwestern Improvement Co.	Red Lodge	Steve Pernovich	20	Austrian	Miner	Injured.			Single.		Falling roof; head, back and leg bruised, leg cut, foot cut.
Carbon	Dec. 2, 1908	Northwestern Improvement Co.	Red Lodge	Illio Babich	29	Austrian	Miner	Injured.					Falling roof; cuts and bruises, face, hands and legs; arm broken and contused.
Carbon	Dec. 2, 1908	Northwestern Improvement Co.	Red Lodge	John Hay	57	Canadian	Foreman tramway		Killed.	Married		8	R. R. Car (Dump car); killed.
Carbon	Nov. 11, 1908	Bituminous Coal Co.	Coalville	Antone Buyjan	22	Austrian	Driver	Injured.			Single.		Moving car; squeezed and bruised about hips.
Carbon	Nov. 2, 1908	I. C. Co.	Bear Creek	Mike Mihajavich	22	Montenegro	Miner	Injured.			Single.		Explosives;; outer layer of skin burned and charred off both forearms, face and neck.

Accident in Coal Mines from October 31, 1908 to October 31, 1909—Continued.

County.	Date.	Name of Company.	Locality.	Name of Person Injured.	Age	Nationality.	Occupation.	Injured	Killed	Married	Single	No. of Children.	Cause of Accident. Extent of Injury.
Carbon	Jan. 12, 1909	Northwestern Improvement Co.	Red Lodge	Carl Grenko	23	Austrian	Miner	Injured.			Single		Falling roof; fracture right foot.
Carbon	Feb. 19, 1909	Northwestern Improvement Co.	Red Lodge	W. T. Rudat	45	German	Miner		Killed	Married		2	Falling roof: killed.
Carbon	Jan. 12, 1909	Smokeless & Sootless Coal Co.	Bear Creek	John Elich	23	Austrian	Miner	Injured.			Single		Falling roof; fracture collar bone.
Carbon	Feb. 8, 1909	Northwestern Improvement Co.	Red Lodge	Enrico Zoldore	31	Italian	Miner	Injured.		Married		1	McGenty: broken leg.
Carbon	Mar. 10, 1909	Northwestern Improvement Co.	Red Lodge	George Vukelich	40	Austrian	Miner	Injured.			Single		McGenty: broken leg.
Carbon	Mar. 9, 1909	Montana Coal and Iron Co.	Bear Creek	A. Anderson	55	Sweden	Laborer (outside)	Injured.			Single		McGenty: broken leg.
Carbon	Mar. 5, 1909	Northwestern Improvement Co.	Red Lodge	Eugene Enrico	35	Italian	Miner	Injured.		Married		1	Explosives; badly burned.
Carbon	Mar. 3, 1909	Montana Coal & Iron Co.	Bear Creek	John Lissnek	30	German	Timberman	Injured.			Single		Moving car: rib and collar bone broken.
Carbon	Mar. 24, 1909		Bear Creek	Frank Costenek	23	Austrian	"Shot firer"	Injured.		Married			Moving car: slight injury to righ lung.
Carbon	Mar. 22, 1909	Washoe Copper Co. (Coal Dept.)	Washoe	R. Fotheringill	32	American	Miner	Injured.		Married		2	Falling roof; lacerated head and face; back bruised: slight internal injury.
Carbon	Apr. 13, 1909	Bear Creek Coal Co.	Bear Creek	Frank Kakar	25	Austrian	Miner		Killed	Married		1	Explosives: killed.
Carbon	Apr. 13, 1909	Northwestern Improvement Co.	Red Lodge	John Puumula	38	Finlander	Miner	Injured.			Single		Gas explosion; face, hands, neck and breast burned.
Carbon	Apr. 13, 1909	Northwestern Improvement Co.	Red Lodge	Matt. Neima		Finlander	Brattice man	Injured.			Single		Gas explosion; slightly burned.
Carbon	June 11, 1909	Washoe Copper Co. (Coal Dept.)	Washoe	Louis Chades	27	Austrian	Miner	Injured.		Married		1	Falling roof: lacerated feet, legs, back, arm, forehead.
Carbon	May 20, 1909	Bear Creek Coal Co.	Bear Creek	Alex Longstaff	42	Englishman	Asst. Foreman	Injured.		Married		4	Falling roof: arm broken: scalp cut.
Carbon	Sept. 16, 1909	Northwestern Improvement Co.	Red Lodge	Andrew Younga	34	Finlander	Miner	Injured.			Single		Falling coal: contusion left shoulder; back injured.
Carbon	Sept. 2, 1909	Montana Coal and Iron Co.	Bear Creek	D. E. Relation	23	Frenchman	Driver	Injured.		Married		1	Moving cars; compound fracture, right leg.
Carbon	Sept. 23, 1909	Northwestern Improvement Co.	Red Lodge	Battista Bala	29	Italian	Miner	Injured.			Single		Moving cars; dislocation left ankle joint.
Carbon	July 8, 1909	International Coal Co.	Bear Creek	Tom. Pavich	28	Montenegro	Miner	Injured.			Single		Moving cars: bruises; ankle spranied.
Carbon	Sept. 19, 1909	Bituminous Coal Co.	Coalville	David Burke	46	Ireland	Driver	Injured.					Moving cars: broken ankle.
Cascade	Jan. 25, 1909	Ed. Gerber Coal Co.	Sand Coulee	Paul Kaikkonen	30	Finlander	Miner	Injured.			Single		Falling coal:: broken leg; head and body injured.
Cascade	Feb. 10, 1909	Nelson-Jenks Coal Co	Sand Coulee	Harvey McKinney	50	Scotchman	Miner	Injured.			Single		Falling roof: two ribs broken, scalp wound.
Cascade	Feb. 25, 1909	Ed. Gerher Coal Co.	Sand Coulee	Wm. Puranen	46	Finlander	Miner	Injured.			Single		Falling roof; broken leg: compound fracture.
Cascade	Jan. 21, 1909	Nelson-Jenks Coal Co	Sand Coulee	Archie McPherson	50	Scotchman	Loader		Killed		Single		Falling coal; killed.
Cascade	July 22, 1909	Ed. Gerber Coal Co.	Sand Coulee	Joe Falzano	45	Italian	Miner	Injured.			Single		Falling coal: dislocated shoulder.
Cascade	Dec. 18, 1908	A. C. M. Co.	Belt	John Sedlac	33	Slavonian	Machine runner	Injured.		Married		5	Falling roof; fracture 12 Dorsal, or first lumber vertebrae, partial paralysis.
Cascade	Apr. 7, 1909	A. C. M. Co.	Belt	Joe Molkan	54	Austrian	Miner	Injured.		Married		2	Explosives; left hand and back of fingers powder burned; forearm, chest arm, face, cuts on temple and forehead.
Cascade	June 5, 1909	Ed. Gerber Coal Co.	Sand Coulee	Nestor Hill	24	Finlander	Miner	Injured.			Single		Falling coal; broken foot.
Cascade	Mar. 29, 1909	Cottonwood Coal Co.	Stockett	Herman Nelson	35	Finlander	Oiler	Injured.		Married		1	Machinery; caught in cog gearing crushing it, necessitating amputation of hand.
Cascade	June 19, 1909	Ed. Gerber Coal Co.	Sand Coulee	Steve Waisick	30	Russian	Miner	Injured.			Single		Falling roof and coal; fractured bone right arm: cuts on head.
Cascade	July 1, 1909	Nelson-Jenks Coal Co	Sand Coulee	Dan Jones	38	Welshman	Driver	Injured.			Single		Moving cars; right arm broken.
Cascade	June 2, 1909	Cottonwood Coal Co.	Stockett	Jack Maki	35	Finlander	Machine runner		Killed	Married		2	Fall of coal; killed.
Cascade	May 18, 1909	Cottonwood Coal Co.	Stockett	Matt. Hasu	23	Finlander	Machine helper	Injured.			Single		Falling roof; dislocated knee.
Cascade	June 2, 1909	Cottonwood Coal Co.	Stockett	George Bubnack	22	Slavonian	Loader		Killed		Single		Falling roof; killed.
Fergus	Mar. 9, 1909	Republic Coal Co.	Roundup	Frank Toraesky	22	Austrian	Driver	Injured.			Single		Moving cars; contused wound over left side of chest, and over right scopura, cuts.
Fergus	Jan. 13, 1909	Jewell Coal Co.	Lewistown	Alex Novak		Austrian	Miner		Killed				Falling roof; killed.
Fergus	Feb. 8, 1909	Republic Coal Co.	Roundup	Joseph Spelish	20	Austrian	Driver	Injured.			Single		Moving car; contusion right hip.
Fergus	July 21, 1909	Roundup Coal Co.	Roundup	Robert Sillman	58	Englishman	Miner	Injured.			Single		Falling roof: contusion of right gheteral region, swelling caused pressure on great sciatic nerve, making use of leg impossible on account of pain.
Fergus	Aug. 3, 1909	Republic Coal Co.	Roundup	Emmett McAndrews	33	American	Driver	Injured.			Single		Moving car: scalp wound on left side; 3 small cuts.
Fergus	Oct. 21, 1909	Roundup Coal Co.	Roundup	William Seeley	33	American	Miner		Killed		Single		Falling roof: killed.
Rosebud	Oct. 25, 1909	Coal Creek Coal Co.	Lock Bluft	H T. Dugan	44	Irish	Miner	Injured.		Married			Falling roof; back broken, ribs broken; lung punctured.
Park	Dec. 4, 1908	Montana Coal and Coke Co.	Aldridge	Jerry Vessel	26	Austrian	Miner	Injured.			Single		Falling roof; head and neck cut.
Park	Dec. 7, 1908	Montana Coal and Coke Co.	Aldridge	Frank Pilch	23	Polish	Motorman	Injured.			Single		Moving cars; knee cut and bruised.
Park	Feb. 5, 1909	Montana Coal and Coke Co.	Aldridge	Joe Brodnick	26	Austrian	Miner	Injured.			Single		Fall of roof; broken leg.
Park	May 20, 1909	Montana Coal and Coke Co.	Aldridge	Antone Poost	63	Austrian	Tipple-man	Injured.			Single		Fell off dirt dump:; skull wounds; symptoms of brain concussion.
Park	June 17, 1909	Montana Coal and Coke Co.	Aldridge	Louis August	42	Austrian	Miner	Injured.			Single		Fall of roof: severe sprain of ankle, liver and spleen compressed.
Park	Apr. 24, 1909	Montana Coal and Coke Co.	Aldridge	Frank Novak	24	Austrian	Miner	Injured.			Single		Fall of roof sprained ankle.
Custer Co.	Mar. 9, 1909	Yellowstone Coal Co.	Miles City	George Jones	32	American	Miner		Killed		Single		Moving cars: killed.
Valley Co.	Aug. 1, 1909	No company (Government land) [6 miles	N. of Plentywood	Edward Cox	24	English	Farmer		Killed	Married			Dirt bank caved on him; killed.

Accidents in and Around the Coal Mines in Montana from October 31, 1909 to October 31, 1910

County.	Date.	Name of Company.	Locality.	Name of Person Injured.	Age	Nationality.	Occupation.	Injured.	Killed	Married	Single	No. of Children.	Cause of Accident. Extent of Injury.
Carbon	Nov. 1, 1909	Bridger Coal and Improvement Co.	Bridger	Frank Oberg	28	American	Laborer	Injured.			Single.		Runaway trip; extent not given.
Carbon	Nov. 1, 1909	Northwestern Improvement Co.	Red Lodge	Tom. Micanovich	22	Austrian	Miner		Killed.		Single.		Falling roof; killed.
Carbon	Nov. 15, 1909	Northwestern Improvement Co.	Red Lodge	Joe Rigis	40	Italian	Miner	Injured.		Married		4	McGinty post pulled out; rope struck his leg, leg broken.
Carbon	Nov. 12, 1909	Northwestern Improvement Co.	Red Lodge	Frank Gross	28	Austrian	Miner	Injured.			Single.		Falling roof; arm injured, extent not given.
Carbon	Nov. 23, 1909	Washoe Copper Co. (Coal Dept.)	Washoe	John Williams	17	American	Driver	Injured.			Single.		Moving cars; head of radius jammed, severe strains of tendroms.
Carbon	Nov. 23, 1909	Northwestern Improvement Co.	Red Lodge	Peter Fernolia	23	Italian	Miner		Killed.		Single.		Fall of roof; killed.
Carbon	Nov. 30, 1909	Northwestern Improvement Co.	Red Lodge	Emil Carlson	26	Finlander	Miner	Injured.			Single.		McGinty post pulled out; rope struck Carlson's leg, breaking it.
Carbon	Jan. 24, 1910	Washoe Copper Co. (Coal Dept.)	Washoe	Frank Harrison	23	American	Driver	Injured.			Single.		Moving cars;; foot bruised and skin torn off the top of foot; foot dislocated.
Carbon	Feb. 4, 1910	Bear Creek Coal Co.	Bear Creek	Wm. Hawthorne	20	American	Motorman	Injured.			Single.		Motor; slight burns exterior of both eyes.
Carbon	Feb. 5, 1910	Bear Creek Coal Co.	Bear Creek	George Demos	27	Creotian	Miner	Injured.			Single.		Falling roof; communited fracture left clavicle.
Carbon	Feb. 16, 1910	Washoe Copper Co. (Coal Dept.)	Washoe	John O'Brian	27	American	Driver		Killed.		Single.		Moving trip; killed.
Carbon	Feb. 24, 1910	Smokeless and Sootless Coal Co.	Bear Creek	Mike Angelich		Montenegro	Miner	Injured.			Single.		Explosive; scalp wounds, left ear torn slightly; cut on arm and knee.
Carbon	Feb. 26, 1910	Washoe Copper Co. (Coal Dept.)	Washoe	Sam McMullen	18	American	Trapper	Injured.			Single.		Moving cars; fracture middle of left fermur bone and scalp wound right side of head.
Carbon	June 20, 1910	Bituminous Coal Co.	Coalville	Andrew Hrobak	25	Slavonian	Driver	Injured.		Married		1	Moving Car; bruised hips.
Carbon	Feb. 28, 1910	Bear Creek Coal Co.	Bear Creek	Jake Vertin	35	Austrian	Miner	Injured.		Married		2	Unloading car of rock; ruptured.
Carbon	Mar. 12, 1910	Northwestern Improvement Co.	Red Lodge	John Milinsknek	22	Austrian	Miner	Injured.			Single.		Falling coal, broken leg.
Carbon	Mar. 16, 1910	Northwestern Improvement Co.	Red Lodge	Joe Finolia	35	Italian	Miner		Killed.	Married			Falling roof; killed.
Carbon	Mar. 17, 1910	Northwestern Improvement Co.	Red Lodge	Sam Polsh (known as Simo Adjukovich)	40	Austrian	Miner		Killed.	Married			Falling roof; killed.
Carbon	Mar. 23, 1910	Bituminous Coal Co.	Coalville	John Toughill	32	American	Miner	Injured.		Married		1	Falling roof; cut on head.
Carbon	Mar. 31, 1910	Northwestern Improvement Co.	Red Lodge	J. Broadbent	54	American	Miner	Injured.		Married		2	Falling roof; broken leg and bruised skin.
Carbon	Mar. 22, 1910	Bear Creek Coal Co.	Bear Creek	Matt. Mear	38	Austrian	Machine helper	Injured.			Single.		Electric Machine; extent not given.
Carbon	May 4, 1910	Northwestern Improvement Co.	Red Lodge	John Herkkala	45	Finlander	Miner	Injured.		Married		5	Falling roof; broken leg.
Carbon	May 20, 1910	Northwestern Improvement Co.	Red Lodge	Joe Heske	30	Austrian	Miner	Injured.			Single.		Falling coal; broken leg.
Carbon	June 21, 1910	Northwestern Improvement Co.	Red Lodge	Phillip Janich		Austrian	Miner	Injured.					Explosives; extent not given.
Carbon	July 24, 1910	Northwestern Improvement Co.	Red Lodge	Herman Leskela	25	Finlander	Tracklayer helper.	Injured.		Married		1	Runaway trip; broken leg.
Carbon	July 24, 1910	Northwestern Improvement Co.	Red Lodge	John Karhu	38	Finlander	Tracklayer	Injured.		Married		5	Runaway trip; bruised about hips and legs.
Carbon	Aug. 9, 1910	Northwestern Improvement Co.	Red Lodge	John Colerio	30	Italian	Miner		Killed.	Married		3	Falling roof; killed.
Carbon	June 14, 1910	Northwestern Improvement Co.	Red Lodge	Matt. Jackovich	25	Austrian	Miner	Injured.					Explosives; extent not given.
Carbon	June 14, 1910	Northwestern Improvement Co.	Red Lodge	Antone Bezich	28	Austrian	Miner	Injured.					Explosives; extent not given.
Carbon	Aug. 23, 1910	Washoe Copper Co. (Coal Dept.	Washoe	Paul Raisenen	41	Finlander	Miner	Injured.		Married		6	Falling coal; broken leg; dislocation left ankle.
Carbon	Sept. 9, 1910	Bear Creek Coal Co.	Bear Creek	Chris. Latovich	25	Montenegro	Loader	Injured.			Single.		Moving cars; abdomen squeezed; bruised hips.
Carbon	Oct. 18, 1910	Northwestern Improvement Co.	Red Lodge	Andrew Eusich	20	Austrian	Op. shaker screen.	Injured.			Single.		Machinery; little finger cut off left hand.
Carbon	Oct. 5, 1910	Bituminous Coay Co.	Coalville	Clyde Hawthorne	21	American	Motor brakeman	Injured.			Single.		Moving cars; slight injury.
Carbon	Oct. 31, 1910	Northwestern Improvement Co.	Red Lodge	Henry Belvidere Rodney	26	American	Rope rider	Injured.			Single.		Moving cars;; astralagus right foot crushed; muscles torn loose from bones in heel; skin split sufarce of heel.
Carbon	Aug. 10, 1910	International Coal Co.	Bear Creek	Joe Lapansky	35	Hungarian	Machine man	Injured.		Married		3	Falling roof; mashed finger.
Carbon	Oct. 15, 1910	Northwestern Improvement Co.	Red Lodge	Andrew Wylmonen	22	Finlander	Timberman helper.	Injured.			Single.		Cable; leg broken.
Carbon	Oct. 25, 1910	Montana Coal and Iron Co.	Bear Creek	Joe Savich	38	Montenegro	Miner	Injured.		Married		3	Explosives; 4 cuts on face; 2 cuts on forehead: 2 on upper lip.
Carbon	Oct. 26, 1910	Montana Coal and Iron Co.	Bear Creek	Rad. Dragich	38	Austrian	Miner	Injured.		Married		4	Falling roof; 2 cracked ribs; lumber muscles of back badly contused; abdomen muscles contused.
Carbon	Oct. 29, 1910	Northwestern Improvement Co.	Red Lodge	Albert Thompson	33	Englishman	Driver	Injured.		Married		4	Moving cars; spragging trip fell; badly bruised and mashed hand.
Carbon	June 29, 1910	Northwestern Improvement Co.	Red Lodge	Charles Veetenan	25	Finlander	Miner	Injured.		Married			Cable; broken leg.
Cascade	Nov. 23, 1909	Anaconda Copper Mining Co.	Belt	John Nemchik	22	Slavonian	Driver		Killed.		Single.		Moving cars; killed.
Cascade	Jan. 12, 1910	Cottonwood Coal Co.	Stockett	Matt. H. Lahti	28	Finlander	Machine helper	Injured.			Single.		Falling coal; broken leg.
Cascade	Jan. 14, 1910	Ed. Gerber Coal Co.	Sand Coulee	Gust. Hawtala	35	Finlander	Miner	Injured		Married			Falling coal; face lacerated; collar bone broken.

Accidents in and Around the Coal Mines in Montana from October 31, 1909 to October 31, 1910—Continued.

County.	Date.	Name of Company.	Locality.	Name of Person Injured.	Age	Nationality.	Occupation.	Injured.	Killed	Married	Single	No. of Children.	Cause of Accident. Extent of Injury.
Cascade	May 28, 1910	Nelson-Jenks Coal Co.	Sand Coulee	Henry Marguerettti	26	Italian	Miner		Killed.		Single.		Falling coal; killed.
Cascade	July 30, 1910	Cottonwood Coal Co.	Stockett	Otto Knavala mbfwy	30	Finlander	Laborer		Killed.		Single.		Falling roof; killed.
Cascade	Aug. 8, 1910	Stainsby-Latham Coal Co.	Sand Coulee	Anthony Centrik	44	Austrian	Miner	Injured.			Single.		Falling roof; scalp wound; 2 ribs fractured.
Cascade	Aug. 24, 1910	Ed. Gerber Coal Co.	Sand Coulee	Pet. Gans	30	Bulgarian	Miner	Injured.			Single.		Falling roof and coal; leg broke; hand cut and bruised.
Cascade	Sept. 27, 1910	Anaconda Copper Mining Co.	Belt	Louis Cubon	28	Slavonian	Machine helper		Killed.	Married		1	Falling coal; killed.
Cascade	Aug. 19, 1910	Cottonwood Coal Co.	Stockett	Matt. Malia	27	Finlander	Loader	Injured.		Married		1	Falling roof; left leg broken.
Fergus	Jan. 4, 1910	Republic Coal Co.	Roundup	Charles Page	36	American	Laborer	Injured.		Married			Moving cars; (surface) contusion both legs; contusion fibula left leg.
Yellowstone	Jan. 4, 1910	Republic Coal Co.	Klein	James Goss	28	American	Cager helper	Injured.			Single.		Coal falling down shaft; fractured arm; contusion arm and muscles; and contusion bone over 3rd Radius.
Yellowstone	Jan. 12, 1910	Republic Coal Co.	Klein	Samuel Simons	42	Englishman	Company man	Injured.		Married		2	Cage striking bottom too hard; sprained and bruised leg.
Yellowstone	Oct. 1, 1910	Republic Coal Co.	Klein	Gregory Bloomstrand	22	Sweden	Teamster	Injured.			Single.		Wagon reach breaking; broken leg.
Yellowstone	Oct. 19, 1910	Republic Coal Co.	Klein	Jessie Finley	24	Not reported	Brakeman	Injured.			Single.		R. R. Car, on surface, end of great toe, left foot, mashed; toe nail torn off.
Yellowstone	Oct. 17, 1910	Republic Coal Co.	Klein	Premo Bernardi	20	Italian	Driver	Injured.			Single.		Maving cars; 2 fingers broken; right foot bruised; first phalanx of 3rd and 4th fingers broken.
Yellowstone	Mar. 24, 1910	Davis Coal Co.	Roundup	Antone Susnek	30	Austrian	Miner	Injured.			Single.		Explosives; arm, shoulder, breast and back cut and bruised.
Park	June 5, 1910	Montana Coal and Coke Co.	Aldridge	Joe Russ	40	Austrian	Miner	Injured.		Married			Falling roof; badly lacerated finger.
Park	June 5, 1910	Montana Coal and Coke Co.	Aldridge	John Chiplock	18	Austrian	Prop cutter	Injured.			Single.		Foot adz; cut on leg.
Park	June 22, 1910	Montana Coal and Coke Co.	Aldridge	Jack Strugal	29	Austrian	Miner	Injured.		Married			Falling roof; bruised and broken leg.
Park	July 9, 1910	Montana Coal and Coke Co.	Aldridge	Joe Custagna	35	Austrian	Miner	Injured.		Married			Falling roof; foot slightly bruised.
Park	Jan. 9, 1910	Anderson and Evans	Hoffman	Joe Buxboam	26	Austrian	Miner	Injured.			Single.		Falling coal and timber; broken leg.
Park	Sept. 13, 1910	Anderson and Evans	Hoffman	John Grandovich	34	Austrian	Miner	Injured.		Married		4	Explosives; loss of right eye; bruised and cut on right arm.
Park	Dec. 10, 1909	Maxey Brothers	Chimney Rock	David Thomas	56	Welshman	Miner	Injured.		Married		2	Falling coal; leg broken; back strained.
Park	Oct. 2, 1910	Maxey Brothers	Chimney Rock	Matt. Patrich	43	Austrian	Miner	Injured.		Married		1	Falling coal; extent not given.